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Rubber Latex Paper Progress

TWENTY paper mills in England are experimenting in the use of rubber latex in paper. Many American, French, Dutch, Italian, and Norwegian mills are following suit. The Paper Division of the Department of Commerce is taking active notice. The Bureau of Standards has requisitioned latex and will conduct tests. A British syndicate has been formed to take over and assign the Kaye patents and, most important, to arrange to supply latex.

All of the above points toward a very definite introduction of rubber into paper. That all paper will be thus rubberized is of course not probable. The daily newspaper will not be printed on a latex treated sheet. The need is not there. But papers that crackle too much will be silenced by rubberizing their fibers; those

that need even partial waterproofing will adopt it; such as are benefited by additional folding endurance or that become better insulators will secure it by the addition of rubber.

That this use of rubber will be great enough to absorb the crude rubber surplus is not to be expected. It will, however, do much. In the meantime there is needed several more Kayes who will introduce rubber into other industries. A dozen doors of opportunity are wide open for such.

The Real Tragedy of Rubber

THE sensational press finds many a sob story in the history of the great industries, while the immeasurable benefits which they have conferred upon civilization are passed over. The red rubber of the Congo, Amazonian, and Central American rubber slavery are typical texts.

The really big tragedy in rubber, however, belongs to the plantation industry on the other side of the Globe. Tens of thousands of British investors poured millions of pounds sterling into rubber until the rush almost swamped the industry. When the great slump came, with characteristic grit, the planters not only held on but with close application, research and experiment, fought to keep it alive. They are steadily losing ground and their failure will be a world calamity. Just what can be done that will be immediately effective is a question that is engrossing many minds. So far the solution does not appear, but that some plan of cooperative control is possible cannot be doubted.

The Still Hunt and Statistics

THE still hunt has, from the beginning, been a sacred institution in the rubber industry. By the term is meant the secret production and marketing of goods that are such as find ready acceptance because of novelty or superior finish; or standard articles produced by processes that admit of profitable price cutting. In the nature of things to report upon these products before the buyers are supplied would be disastrous. Soon enough after the launching will competitors bring out similar, perhaps better products and at even prices. Such being the situation the still hunt has always and will probably continue to be the policy of the industry in respect to goods of the types mentioned. Nor is there likely to come the day when no such condition of affairs is possible. The manifold combinations of materials used in rubber manufacture, the varied processes, and the multiplicity of special machines, many of a secret nature, all lead up to individual productions, novel effects, improvements in the most staple commodities.

Reports of a statistical nature on these goods are not wise nor necessary. If demanded by law they would stifle invention and imperil progress. Fortunately the great bulk of rubber goods do not come under this category.

They are made on more or less standard lines and prices and product are far from being secret.

The gross amount of rubber used in the industry—and of fabric as well—given to all manufacturers at frequent intervals is of the greatest benefit. Nor can such figures injure the individual manufacturer in the slightest degree. So too, the total number of tires made by all manufacturers, prevent oversupply and serve to stabilize prices. The corollary is that if this is good for the tire trade, gross statistics in all other staple lines of manufacture is equally beneficial. The fact is the still hunt in specialties and statistical frankness in staples spell prosperity to the rubber trade.

Inventor of the Telephone

ALEXANDER GRAHAM BELL, full of years and honors, has passed on. What the world owes to the inventor of the telephone is being told in newspapers and reviews in every language. So, also, is the life history of this Scotch-American scientist ably portrayed. In all of this the rubber trade is sympathetically interested. To a degree, moreover, there is another bond distinct from that of all others. The Bell invention called into being uses of rubber hitherto unknown and in constantly increasing volume. Thus he was particularly well known and deeply appreciated.

Speaking of Taxes

THAT a multitude of our economic ills can be justly ascribed to the method of taxation adopted by the United States Congress in 1917, and since continued, is the claim of Otto H. Kahn, recognized as one of the foremost American students of finance.

He reviews in masterly fashion the operation of the legislation framed to meet the nation's war burdens, and deduces the conclusion that the taxing scheme has not only partially defeated its own purposes as a revenue measure but has, in its conflict with the principles of sound economics, directly and to a larger extent than any other cause occasioned the cost of living to mount to a degree hitherto unknown.

He does not minimize the importance of three other disturbing economic factors, namely: the international demand during and since the war for American raw and finished products, inflation of credit and currency, and governmental and private extravagance; but all these, he says, will take time to adjust to a normal status. With respect to faulty taxation, however, Mr. Kahn says, the remedy can be provided and substantial relief afforded at once by Congress and the Administration.

In his criticism of the operation of the chief three direct levies, that is, income, inheritance, and excess profit taxes, he inveighs especially against the latter and stresses the fact that an overmuch tax will destroy its own productivity. "The excess profit tax," he says, "lays a heavy and clumsy hand on successful business activity. It is grossly

inequitable in its effects. It puts a fine on energy, enterprise, and efficiency. It leaves untouched the man of wealth who neither works nor takes the risks and responsibilities of business, but merely collects his coupons. It is bound to operate unfairly, freakishly, and unevenly, and to greatly enhance the cost of things." With the modification of the excess profit tax he counsels a well-judged revision of the scale of taxation of individual incomes to encourage national industry and initiative.

IN ANOTHER COLUMN WILL BE FOUND A VERY IMPORTANT communication from Cyril Baxendale, Esq., a prominent British planter, regarding splinters in rubber. He asks just what rubber, shipped from whom, and by whom, is splintery. That question should be answered in detail. Once the Rubber Growers' Association or the rubber planters know what shipments are faulty, a long step toward remedying the difficulty will be taken.

TRAVELING TIRE SHOPS ARE APPEARING IN THE WEST. They consist of auto trucks stocked with tires, tubes, boots, patches and tire tools. So far they represent individual manufacturers, but if they prove profitable, general tire stocks, and even traveling repair shops may be evolved.

IN AKRON, CIVIC LOYALTY REACHES ITS LOFTIEST heights. As an example, an Akron company contracts for pages in the local rubber paper, but to reach the whole trade it advertised this advertisement in THE INDIA RUBBER WORLD. Praiseworthy, but roundabout. Lest the reader suspect a merger of the two papers we hasten to deny any financial interest in our breezy contemporary.

DR. PHILIP SCHIDROWITZ, WHOSE SCIENTIFIC comment month by month in *The India-Rubber Journal* is always of great interest and value, has this to say about glue, something that will be appreciated by all modern compounders:

"There can be little doubt that glue, as a compounding ingredient, has come to stay. Roughly, glues may be divided into two classes, namely; hide glues and bone glues, the former as a class being distinctly superior to the latter, although considerable improvement in the manufacture of bone glues has taken place within recent years. There are, further, numerous subdivisions as regards quality (cleanness, absence of undesirable ingredients, acidity, moisture, and various physical properties besides tenacity or strength) in both classes, but broadly, different grades of glue vary probably as much if not more than the whole range of rubbers, including plantation grades and all the "wild" sorts. The rubber manufacturer should be as careful in regard to purchase and testing of glue as he is of any other material subject to variation in quality. THE BETTER THE GLUE THE BETTER THE MIX. VERB. SAP.

Rubber Paper from Fiber Pulp and Rubber¹

Comments Upon the Kaye Patents and Others

By Gustav Heinsohn

So much of interest has been shown in the addition of rubber latex to paper that a brief but by no means complete review of the subject would seem to be timely. I might add that the Editor of THE INDIA RUBBER WORLD warns me that the article must be constructive and not destructive. He feels that Professor Kaye has "started something" and should have full credit for what he has done, and that his patents should be respected and his many experiments fully appreciated.

It should be said by way of preface that Mr. Kaye is a well-known rubber technologist and research chemist. He is at present lecturer on rubber at the College of Technology, Manchester, England. He is the author of numbers of scientific papers, as "Rubber Cultivation in Uganda," "The Chemical Coagulation of Rubber Latices," etc. His studies in rubber planting embrace Hevea and Funtumia rubber in Africa and Castilloa in Mexico. His chemical investigations cover synthetic rubber, methods of analysis of vulcanized rubber together with much research work on plantation rubber. From 1911 to 1917 he was lecturer at the Northern Polytechnic Institute in London. In 1917-1920 he was chief research chemist to Turner Brothers, Limited, the great British asbestos company.

The Kaye Process

The Kaye patent—British patent No. 167,935, October 12, 1921—calls for the latices of rubber, gutta percha or balata added separately or together to paper pulp during manufacture. These latices may be beaten up with the pulp and after the addition of a coagulating agent such as acetic or formic acid or other suitable organic or mineral acid or mineral salt, made into paper in the ordinary way. The rubber paper may be vulcanized by the Peachey process or any other suitable method.

Described briefly, rubber latex diluted with water is added to pulp in the beater of a paper making machine and thoroughly mixed with the pulp. The experiments of Mr. Kaye have been chiefly with cotton, linen, bleached sulphite, bleached esparto, bleached straw and bleached bamboo pulps. The use of the latex, according to the inventor, does not affect the color of the paper. It also shortens the time of beating, increases the strength, and renders it pleasanter to the touch. Such paper is also made water repellent, the electrical resistance and dielectric properties are increased, loading matters are more easily retained, and less dye is needed in the production of colors. The cost of latex is figured at about 20 to 25 cents per pound for actual rubber content. It should be remembered that the rubber content in latex is about 33 per cent.

The patent therefore divides itself into three sections: first, the addition of latex to any kind of paper pulp; second, the addition of a coagulant to the mass; third, the vulcanization of the rubber and paper product.

The great bulk of the rubber used in the manufacture of goods of any sort is of course coagulated rubber, that is in the form of a very resilient solid. That "liquid rubber," that is rubber milk containing the rubber molecules in a watery solution, has been neglected by manufacturers is, however, not the fact.

Pioneer Work of Hancock

The use of rubber latex in combination with fibers dates back certainly to 1825. It was practiced by Thomas Hancock of the firm of Charles Macintosh & Co., of Manchester, England. In

March of the year named, Mr. Hancock in describing a liquid with which he treated fibrous substances said: "The liquid I use is said to be the juice obtained from certain trees that grow in several parts of South America, the East Indies, and other places. It is stated that this juice is from a tree that is called the 'Hevea'. . . ."

"The fibrous compound is made of fibrous substances with liquid caoutchouc. . . ."

"I only claim as the subject of this patent the manufacture of various articles of the combination or compound of liquid caoutchouc with fibrous or other materials."

Thus the latex most commonly used in the present-day experiments, that of the *Hevea brasiliensis*, is exactly what Hancock specified in his patent. The pioneer inventor later used latex from Mexico, that of the Castilloa. He also had the same trouble that shippers of latex unacquainted with preservatives are bound to experience. Five years after his first liquid rubber patent he wrote:

"In 1830 I took out another patent for the application of the pure liquid rubber, as drawn from the trees, to a number of useful purposes. I was induced to take this patent from the persuasion that this article, having once been brought over in the liquid state, could be brought again, if proper steps were taken to procure it.

"On the recommendation of a friend, I employed a person in Tampico to conduct this business, and sent him instructions for collecting it according to the best information I had been able to obtain. A large quantity was collected and sent over in good sound barrels, well stopped; but, on opening, I found in the majority of them a solid mass of good rubber and a brown fluid. On inspection it was evident that the solid part of the rubber had separated from a dark-colored watery fluid, and had taken the form of the end of the barrel, where it was found deposited. In some of the barrels, however, the separation had only partially taken place, and I obtained some rubber in the creamy state.

"Another lot arrived much in the same condition; and such were the expenses incurred and the loss sustained, that I gave up the attempt, and all my patents for the application of the liquid expired before I could obtain it in any sufficient quantity. Nevertheless, I am persuaded that its importation is practicable, as I have in my possession a small quantity which I treated in a particular way many years ago: and it remains a fluid to this day.

"I may also mention that several barrels were afterwards sent to this country, which had undergone some treatment in the country where it had been produced, by which it was preserved in a kind of semi-fluid state, and was in the market here, and purchased by several persons. Samples have recently been brought here and proved satisfactory: these last had been treated with an admixture of ammonia."

Quite recently also a well-known British chemist was granted a patent for a composition of latex mixed with glue. While the intent of this patent was to produce an adhesive substance and not to be used in paper making, there is probably no reason why it could not be so used without interference on the part of the Kaye patent. Early this year also another British patent was taken out for the manufacture of rubber compositions from wood dust, cotton and other fibers, to which was added the rubber latex.

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Latex Is Rubber Solution

Granting that rubber latex is rubber in solution there are numbers of patents that would seem to conflict with that of Professor Kaye's, for example in 1856, Edwin Bromley patented pulp cloth saturated with a solution of caoutchouc, gutta percha or similar gum.

In 1833, Williams was granted a patent covering fibrous materials formed into a bat run through rollers into a cistern containing adhesive composition, then carried by a web over a drying machine.

In 1858, Newton patented the product of fibrous substances in an unwoven state saturated with compounds.

In 1862, Austin produced sheets of paper fibers intermixed with pulp treated with waterproof solutions.

In 1863, Reynell produced sheets from fibrous substances mixed with india rubber and gutta percha in a liquified state.

The Peachey process is specified as that best suited for use in vulcanizing rubber latex paper. This is a vulcanization process which brings about curing without the aid of heat. Described briefly it involves exposing rubber alternately to two gases, sulphur dioxide and hydrogen sulphide, and would involve the construction of special vulcanizing chambers. That other systems might avail is probable.

The vulcanization of paper-like sheets was suggested by the patents of Gervaise and Bernier in 1861, where vegetable fibers to which are added caoutchouc and like substances are passed between rollers and vulcanized by a jet of sulphurated steam.

The well-known cold cure process was also employed by Young in 1875, his claims calling for vulcanizing, without heat, filaments or fibers that had been treated with rubber by a combination of bisulphide of carbon and chloride of sulphur.

The veteran rubber manufacturer, Charles Moseley, patented in 1876 paper combined with india rubber subjected to the ordinary vulcanization process.

There still remains the dry heat, the old-time vapor cure, solarization and even ultra-violet rays.

Paper Pulp Fibers and Rubber

The patents for the combinations of wood and other fibers with rubber are exceedingly numerous and have been distributed through a series of years.

In 1857, Tayler combined fiber or wood with india rubber, gutta percha, or waste india rubber.

In 1860, McKibbin combined flax refuse, felt, or other light, cheap material united by adhesive matter.

In 1863, Snell patented sheets of fibrous matter mixed with gutta percha or rubber.

In 1864, David Moseley patented felted fabrics of fibrous substances combined with india rubber, gutta percha, balata or any of their compounds, vulcanized by either Hancock's process or Parke's process.

In 1866, Danchell patented the combination of wood flour and india rubber.

In 1868, Forster patented wood fiber treated with a solution of caustic potash and combined with rubber.

In 1869, Briggs patented paper and textile fabrics united by adhesive substances.

In 1875, Hebblethwaite patented unwoven fabrics of waste silk and any adhesive substances combined therewith.

In 1876, Node patented wood pulp mixed with gummy or resinous substances.

In conclusion may we add that Professor Kaye in adding rubber latex to paper pulp starts rubber manufacturers in the study of paper making, while paper producers learn about rubber. This is excellent. Nor are the two industries so far apart. Each uses grinding mills, hollanders and calenders. Their products have always intermingled and overlapped more or less. Perhaps this will bring them even closer together.

Rubber Blankets for Textile Printing Machines

Textile goods, paper-box covering and wall papers are printed on a color-printing machine of the type shown in Fig 1. The printing rollers are of copper, one for each color which is

supplied by a fabric-lapped wood furnishing roller. A scraper removes excess color taken up from the receptacle in which the roller runs. The central drum of the machine is clothed with an endless rubber blanket and absorbent apron as illustrated in Fig. 2. The rubber blanket lies next to the drum, passing over rollers above the machine and around another roller on a screw-operated stretcher located at the end

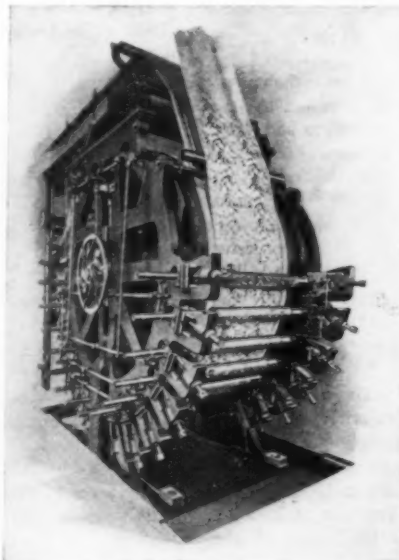


Fig. 1. Fourteen-Color Machine

of an overhead frame. Between the blanket and the fabric being printed is run an apron of gray goods which serves as a pad to absorb excess of color passing through the goods during printing.

Function of the Blanket

The function of the blanket is to serve as a conveyor for the goods passing through the machine and also to act as an elastic backing for the goods under pressure of the printing rolls.

Types of Blanket

The mackintosh blanket is cloth-faced, consisting of two plies of fabric united by a layer of rubber. A range of fabric weights are used for making mackintosh blankets, according to the char-

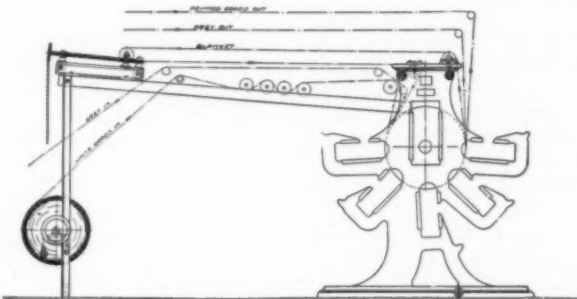


Fig. 2. Blanket and Clothing of Textile Printing Machine

acter of the goods to be printed. For awning stripes and cretonnes for furniture coverings, duck-like fabric is used. The different fabric weights range downward to light sheetings made up in numerous plies for use with lighter-weight goods. For printing silks and paper a smooth rubber-face blanket is required instead of the mackintosh style. Each class of fabric to be printed represents a special problem in type and construction of blanket and much skill in manufacture to produce it.

Bakelite

Bakelite Described—Plastic Molding—Molds—Molding Bakelite—Plates, Rods and Tubes—Applications—Specific Properties of Bakelite

PROFESSOR CHARLES F. CHANDLER said, in his presentation address on the occasion of the award of the Perkin medal to Leo H. Baekeland¹, in recognition of his most original and valuable work in applied chemistry: "Dr. Baekeland's crowning work is the solving of the mysteries involved in the action of formaldehyde upon phenols, and giving to the world the new material, Bakelite." A fitting tribute to the chemist-inventor.

Bakelite Described

Unlike most raw materials Bakelite is neither mined nor extracted from plant life. It is a synthetic substance produced in the chemical laboratory, a so-called condensation product of phenol, or carbolic acid, and formaldehyde. Instead of phenol, its homologs, cresol or other phenolic bodies, can be used. Instead of formaldehyde, other substances which have the same functions may be utilized, as for instance, methylal, paraform, and hexamethylene tetramine.

Formaldehyde in reacting upon phenol does not necessarily produce Bakelite. Quite the contrary. It is only under very special conditions that this substance can be obtained. In fact, when formaldehyde is allowed to react on phenol under ordinary conditions almost anything may happen but the formation of Bakelite.

When these established conditions are met, however, the two liquids involved react to form a resin-like material, which may be melted or dissolved in certain solvents such as alcohol or acetone. This material is a synthetic resin of very peculiar property. Under the influence of heat it first melts, then rapidly becomes hard and solid, due to the chemical change induced in the material itself by heating. After hardening in this way Bakelite cannot again be softened nor can it be dissolved in any degree by alcohol or acetone. It is impervious to the action of water and oils and is, in fact, thoroughly insoluble and infusible; being chemically inert it is free from deterioration by any chemical change such as oxidation, hydrolization, etc.

Pure Bakelite has a transparent amber color well known by its extensive use for pipe stems, cigar holders, beads, fountain pens, pencils and many other ornamental or novelty articles.

Bakelite was the first phenolic resin or condensation product of phenol and formaldehyde ever successfully molded in quantities for electrical purposes.

It is used extensively as the binding substance in molded insulation by mixing it with various filling materials such as asbestos fiber and wood flour. These not only reduce shrinkage in molding but greatly improve the product.

All powdered fillers which are successfully used in conjunction

with other plastics, do not improve Bakelite, but injure it. This is probably due to the fact that Bakelite, although it has an unusually high tensile strength, has a relatively low degree of elasticity which makes it sensitive to impact and shock. The introduction of fibrous materials into Bakelite makes it enormously more resistant to shock than the pure article.

Asbestos was the first filling material used because of its fibrous character and its resistance to high temperatures, but it is always very difficult to produce pieces with this material which meet every requirement and are entirely satisfactory from the electrical standpoint.

Since the discovery and application of Bakelite, the molding of phenolic resin insulation has become a recognized industry employing a large number of people turning out millions of dollars' worth of product yearly.

Plastic Molding

The applications of Bakelite in the art of plastic molding are innumerable. The manufacture of raw Bakelite in its several forms, pure, compounded, and as varnish, is conducted only by the General Bakelite Co. For plastic molding the stock comes in finely powdered form put up in steel gasketed drums so tightly sealed as to be waterproof even if submerged in water indefinitely. Powdered Bakelite has been kept for three years and found perfectly workable, which indicates its permanent nature.

Plunger and Flash Molds

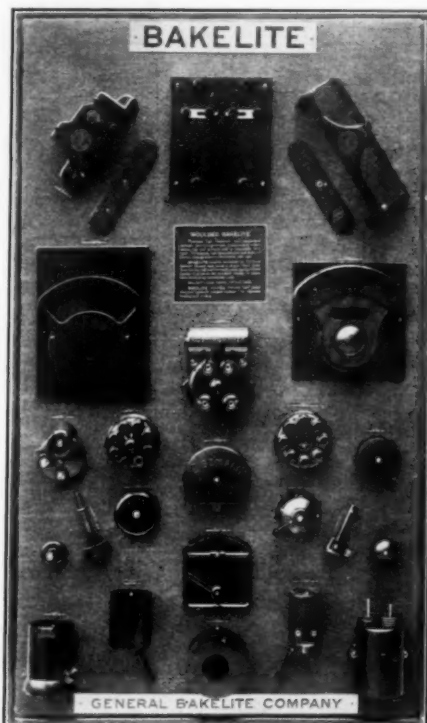
In the operation of molding Bakelite, case hardened steel molds of the plunger or closed type are used and differ in this respect from those of the flash or open type commonly used in making molded articles of rubber.

In the open type mold the two parts are brought together until one rests on the other, whereas in the closed type, one rests within the other.

In rubber work open molds are the rule although closed molds are sometimes used. In molding phenolic resin products, however, closed molds are a necessity, owing to the nature of the material and the conditions required for hardening it.

Molding Bakelite

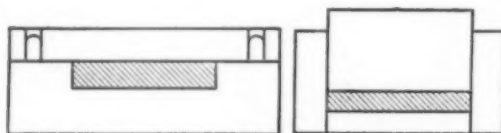
To produce a molded Bakelite article the steel mold parts are mounted on the steam heated platens of a powerful hydraulic press. The mold cavity is filled with a carefully weighed quantity of molding powder. Closing the press brings the plunger member to bear with heavy pressure on the material in the cavity while the heat fuses the compressed stock which takes the exact shape and size of the cavity. The temperature of molding, about 350 degrees F., induces a chemical reaction which rapidly changes the Bakelite into a hard, lustrous, finished product. The molding cycle is about 5 or 6 minutes, including heating and cooling. The object comes from the mold true in shape and ready for use.



Molded Electrical Parts and Other Products

¹Presentation address by C. F. Chandler delivered at the regular meeting of the New York section of the Society of Chemical Industry, Rumford Hall, Chemists' Club, January 21, 1916.

Owing to the nature and working qualities of Bakelite, molded objects can be made with inserts of metal rigidly enclosed during



Open Mold

Closed Mold

molding. This feature admirably fits it for molding complicated pieces for electrical uses.

Powdered molding Bakelite is prepared according to certain exact formulas which insure a product of specific and recognized properties, unalterable by the molder. It is this simplicity of reproduction, accuracy, stability, mechanical and dielectric strength that makes molded phenolic resin products suitable for innumerable applications.

Plates, Rods and Tubes

Apart from its use for molded articles Bakelite is used in other forms as plates, rods and tubes in radio instruments and many other electrical purposes. Plates, rods and tubes are built up by laminating plies of tough paper or linen impregnated with Bakelite varnish. The built up forms are then subjected to heat and heavy pressure to change the Bakelite binder into its infusible and inert state. These combination products are known as Bakelite-Dilecto and Bakelite-Micarta and possess all the properties of Bakelite combined with the inherent toughness of the fiber used. Bakelite in the form of Micarta or Dilecto lends itself readily to machining operations.

In general it may be said, that Bakelite, in common with other phenolic resin products, is a heat-resisting, highly dielectric material. It is impervious to oils, steam, water, or any known



Filling the Molds with Powdered Bakelite

solvent; is light in weight, mechanically strong and chemically inert.

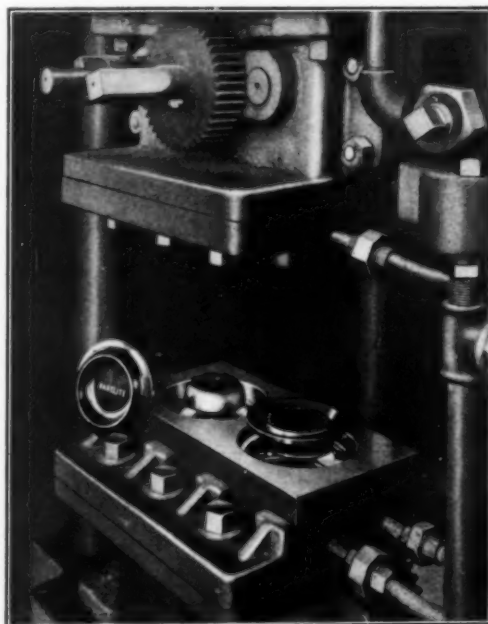
Specific Properties of Bakelite Plates, Rods and Tubes

Continental Fibre Co.'s Figures for Bakelite-Dilecto

Dielectric strength, average.....	650 volts per mil.
Dielectric constant, approximate....	5.
Coefficient of expansion.....	.000025-inch per inch, per degree C.
Specific gravity.....	1.38
Tensile strength, average.....	18,000 pounds per square inch
Compressive strength.....	
Parallel to lamination.....	22,500 pounds per square inch
Perpendicular to lamination.....	41,000 pounds per square inch
Transverse strength, average.....	22,000 pounds per square inch
Modulus of elasticity.....	1,500,000
Insulation resistance.....	
Volume resistivity.....	10 ¹² ohms per cm. cube

Applications

Enumeration of the application of Bakelite and phenolic condensation products is practically impossible; however, the following indicates their wide range of use: insulators, wireless panels and accessory parts, pump valves and meter disks, airplane propellers, gears and pinions, pipe stems, automobile parts and ignition insulation, grinding wheels, telephone shells, chemical agitator paddles, dash pots, armature and coil impregnation, lamp basing



Final Operation in Molding Bakelite

cement, billiard balls, handles, beads, necklaces, and a great variety of other useful and artistic objects.

Specific Properties of Molded Bakelite

Tested in Accordance with the Specifications of the American Society for Testing Materials

Tensile strength	4,400 to 5,100 pounds per square inch
Compressive strength	32,000 to 35,000 pounds per square inch
Transverse strength	12,600 pounds per square inch
Dielectric strength	450 to 550 volts per mil.
Coefficient of expansion.....	.00003-inch per inch, per degree C.
Specific induction capacity.....	4.5 to 5.5
Specific gravity	1.35
Weight per cubic inch.....	.78 ounce
Standard colors	Brown, black or red

FALL CONVENTION OF THE M. A. M. A.

Plans are being prepared for the fall convention of The Motor and Accessory Manufacturers' Association, which will be held at the Hotel Lafayette, Buffalo, New York, September 13 to 15, inclusive.

At the general session President E. H. Broadwell, vice-president and general manager of The Fisk Rubber Co., will preside, while Sherman W. Darman, export sales manager of the Klaxon Co. and vice-president and general manager of the Overseas Motor Service Co., will be chairman of the session devoted to foreign trade.

In addition to this general session there will be special meetings of the credit managers, the advertising managers, the traffic managers and the export managers, all representing distinct functions and activities of the association in behalf of the four hundred affiliated manufacturers of parts and equipment.

Drum Built Tires

A New Tire Building Process

THE problem of supplanting square fabric tire construction by cords, and extending the benefits of that type of construction at popular prices to millions of users of small tires, as well as effecting economy of production in all sizes, is involved in the newest development of tire manufacturing. Possibly also there may have been a desire to outmaneuver the gyp in the matter of price.

Certain it is that a notable achievement in tire construction has been attained in the process of flat building tires known as the drum method, supplemented by curing in special single mold heaters or steam cavity molds. Various machines covering the use of this system have been patented and perfected during the past few years and are now in successful operation by several of the important tire companies.

Core Built Tires

Hitherto, every tire building process, whether by hand or machine, has required the use of a metal core or ring having the

cross sectional shape of the cavity of the tire casing when finished, upon which to build up and form the plies of fabric and to locate the beads. On this plan great care is exercised to build the tire to gage in order that it may fit the curing mold and cure in perfect condition, especially in case the tire is cured upon the core.

In the new system the building core is completely eliminated and in its place a simple pulley is substituted, together with a forming-up drum preliminary to mold curing.

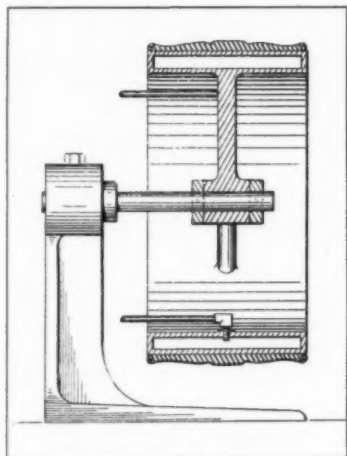


Fig. 1 Tire Building Drum

ing on an airbag in an individual mold vulcanizer.

Flat Tire Casing Building

From one of several patents relating to the flat method of tire building the following plan of construction and method are taken.

The object is to obtain the advantages of stretching or straightening the threads of the casing without the employment of any airbag construction during the vulcanizing process, so that the cost resulting from their destruction shall be eliminated. Also to avoid the use of the core in any such manner as shall require the nicety of fit necessary where the casing fills the space between the outer surface of the core and the surface of the mold cavity.

Building Drum

Fig. 1 shows a vertical section of a hollow drum designed to be steam heated and used for the purpose of warming the pulley band carcass previous to forming it to tire shape.

The drum is mounted to revolve on a support or stand for convenience of the operator in applying the various fabric plies, beads, and rubber parts.

Tire Forming Drum

After the tire is built as a flat band on the drum shown in Fig. 1, it is transferred to a second or shaping drum to receive its roughly defined final shape. The forming drum is illustrated in Fig. 2 partly in side elevation and partly in cross-section.

The forming drum is in two parts or sleeves, A and B, with an interval between spanned by a ring, C, supporting an inflatable

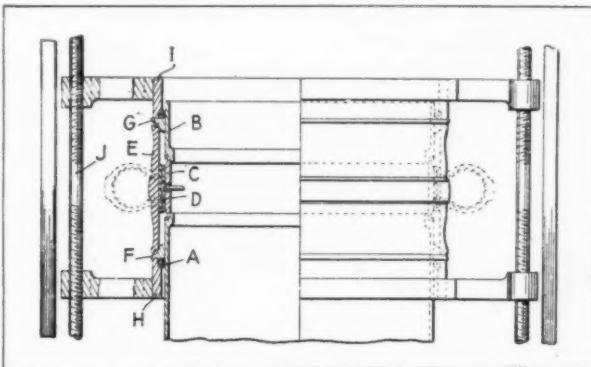


Fig. 2 Tire Forming Drum

tube, D. The cylindrical flat tire E is located on these sleeves and adjusted centrally over the inflating tube. Metal bead and lock rings F and G are placed against both edges of the flat tire band when in position for forming. Against these rings are the following up rings H and I. These following up rings move toward the center line of the apparatus by the action of the right and left threaded screws J, and operating through lugs, as on H and I.

The combined action of the inflating tube and pressure of the rings H and I shapes up the flat pulley-band tire into the dotted form in Fig. 2 and again in Fig. 3, where it is shown shaped and locked on the band C expanded ready for vulcanization. Previous to the latter operation, however, the inner tube is removed.

It has been found that if the threads of an uncured tire casing are held stretched by expansion to full finished size much of the tension and resistance of the threads is taken out, and if held in this condition a proper length of time the rubber is so compacted in the fabric that after removal of the tube the casing can be

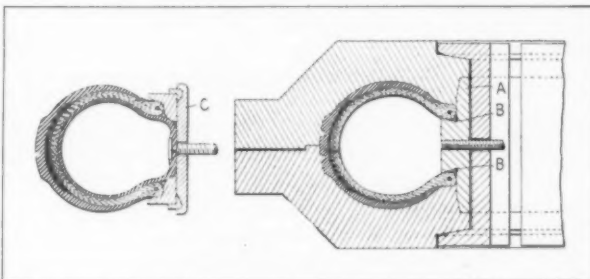


Fig. 3 Formed Tire Casing. Fig. 4 Finished Casing in Curing Mold

again expanded to the size at which it has been set without disturbing the sealing effect of the rubber. This condition allows the casing to be cured without the use of any solid core or mandrel or any expanding tube or airbag.

¹ United States patent No. 1,289,767.

Steam Curing Mold

In the final vulcanizing operation the casing is sealed by bridging its edges as illustrated in Fig. 4, which shows in cross-section the casing in a curing mold mounted on a bull ring *A*, the angles of which are grooved and filled with unvulcanized rubber packing *B* to form a seal between the ring *A* and the edges of the casing.

The process described above is applicable to casings made of cord fabric as well as to those made of square-woven fabric. In the latter case the spliced ends of the fabric making up each ply are lapped farther than usual in order to permit of the slip which takes place during the forming operation.

Factory Practice

The principle of building a tire carcass as an endless flat band on a drum and subsequently forming it into approximate finished shape for molding is applied with variations of detail and apparatus in different factories.

Ford Size Cords

The method is most effectively used in making Ford size cords as follows: The fabric frictioned and skimmed is cut on a longer bias than usual which reduces splicing. The cuts as made on the bias cutter are laid end to end and rolled on a shell. On the splicing table the cuts are doubled or made two ply with the bias threads crossing. The two-ply fabric is joined in lengths and rolled again on a drum with a cloth liner ready for the tire builder.

The motor driven making drum or pulley is not necessarily heated. One form is a simple split drum connected with a clutch so that it can be expanded. The operator applies the double bands of fabric around the drum, rolling and stitching it down on the plain surface. Cushion and breaker strip are similarly added. A gage is applied as the drum revolves to mark the location of the beads, which are made, cured, and prepared as usual and directed to place by a simple straight tool.

After the tread sidewall has been applied, rolled and stitched, the tire is removed from the building drum for expansion to form

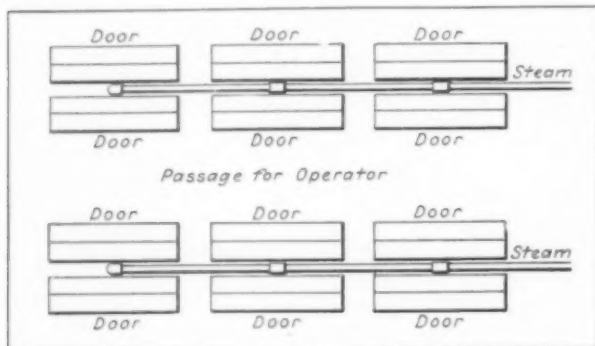


Fig. 5 Plan of Individual Heaters

over a special collapsible drum on which an inner tube is arranged in a circumferential cavity, essentially as already indicated.

Alternative Expanding Method

Another practical method for shaping the cylindrical tire is by placing it between the platens of a hydraulic press and forcing it to shape by means of pressure applied by an airbag.

The tire is thus set in suitable size and shape for the molds and cured on airbags.

Improved Airbags

The great cost in tire making represented by the expense and short life of ordinary airbags has been greatly reduced by the development of airbag stocks and heavy tube construction made on the tubing machine. Whereas, a few years ago an airbag

might last for 50 curing hours, it is now not uncommon for them to do service for double or even four times that period before repair for further service.

Single Mold Tire Vulcanizers

An important improvement has been made in the manner of handling the curing problem, saving costs of both equipment and

labor. This is the steam cavity mold or individual mold heater. It consists of a shallow two-part heater set on edge in pairs back to back in parallel rows between which is a passage for the operator, after the arrangement shown in Fig. 5. Each heater contains a single tire mold, the two parts of which are fastened in place, one in the back of the heater and the other on the door. The latter is hinged at the side as shown in Fig. 6,

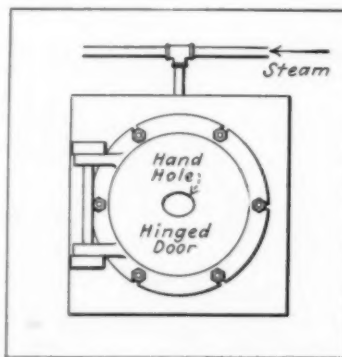


Fig. 6 Front Elevation of Individual Heater

which is the front elevation of an individual heater.

The door is closed against a packing and held by a number of bolts around its circumference. In the center of the door is a hand-hole for convenience in releasing the airbag pressure by unscrewing the valve and loosening the bag before opening the door when the heat is finished.

When the door section is swung open the cured tire remains in the rear section from which it is removed and a new tire set in place, air pressure connected to its bag, and the mold-heater closed for another cure.

Each pair of heaters has a steam line in common. Steam remains on the molds continuously, regulated by automatic control. The interval for loading and unloading a tire from a mold heater is about three minutes. In the curing interval of one hour a single operator fills and empties twenty of these steam heated molds or mold-heaters.

This is a great gain in operating efficiency over the heavy hydraulic press vulcanizing which, although capable of curing 20 tires at a heat, requires considerable hydraulic power and a crew of men for its operation, handling the molds in and out of the vulcanizer.

Economy of Manufacture

The method requires somewhat radical changes in making and curing equipment but results in a large saving of labor and loss from production of seconds. The reduction in labor costs on Ford size tires amounts to about twenty per cent compared to those of 1920. This saving in manufacturing cost has been shared with tire users by the manufacturers in the notable reduction of tire prices last spring.

RATIO OF TUBES TO CASINGS

Purchases of automobile tubes, during the year 1921, by American motorists were in the ratio of one tube to every one and one-quarter casings, while foreign buyers of these goods took only one-half tube to every casing. This is evidence that other countries used their own makes of tubes to a greater degree than their casings.

Statistics recently compiled by The Miller Rubber Co., Akron, Ohio, show that the rubber industry is selling even more tubes this year than last, both in the domestic and export fields. A tube and a half to every casing sold is the record in this country for the first five months this year, and three-fifths of a tube to every casing sold to the foreign buyer.—Miller News Service.

Rubber Materials in Airplane Construction

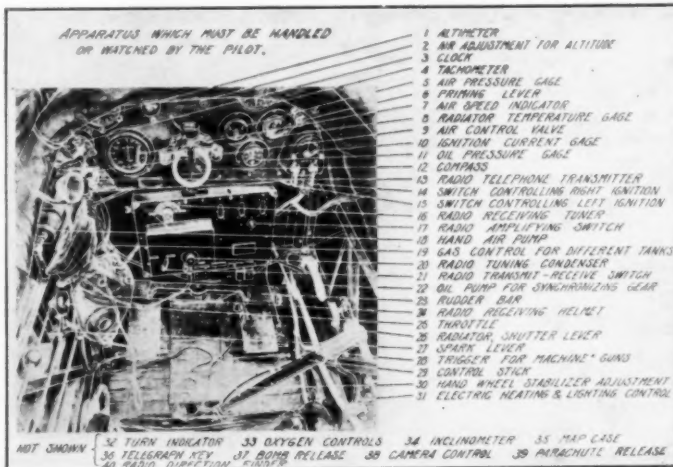
Clincher and Straightside Tires—Inner Tubes—Airplane Wheels—Palmer Type—Straightside Type

By C. J. Cleary¹

THE lay mind does not ordinarily think in terms of rubber materials when things aeronautic are discussed, nevertheless rubber materials of a wide variety and description are of considerable importance in the satisfactory performance and operation of airplanes. At the start let it be understood that this paper is not offered as technical information but rather to give a broader and better idea of the part that manufactured rubber plays as a material of construction in airplanes of every description.

In general, the main classes of rubber materials used on airplanes are as follows:

1. Airplane tires and tubes.
2. Shock absorber or elastic cords.
3. Rubber covering for leak-proof tanks.
4. Gasoline hose.
5. Radiator water hose.
6. Insulation for high tension and low tension electric cable.
7. Miscellaneous rubber goods.



Pilot's Cockpit Showing Control Apparatus in Which Rubber Is Largely Used

Airplane Tires

Clincher tires were and still are almost exclusively used on airplanes of the older types. Although straightside tires and wheels are now at a point where they have been generally adopted for all new types of military airplanes, this discussion will be confined to the clincher type with which practically all of the tire trouble was experienced. The chief reason for the use of this particular type was in order to permit interchangeability of parts with the French and English machines during the past war. Development of airplane tires previous to the activities resultant upon the war was practically nil, and when the demand for production was so great, the European practice and experience were accepted entirely and without question.

No doubt the limits of wheel loading, as indicated by the European practice, would have been satisfactory had they been maintained, but weight was constantly added to

the armament which includes bomb loads that are very heavy. It can readily be seen that this would be the normal tendency, especially in military airplanes, and the consequent result of this overloading—neglecting at the same time to increase the tire size—was constant tire trouble which was unfortunately always blamed on the tire manufacturer.

Airplane Inner Tubes

This condition has been corrected in part by indicating to the designer a "maximum plane weight per wheel" for each tire size. This limitation is explained more fully below.

The inner tubes used in airplane tires have always been essentially the same as the automobile inner tubes, with special reference to the quality and physical properties of the rubber compound, the nature and treatment of the tube splice, the thickness of the tube wall. Except for the fact of the difference between the automobile tire sizes and the airplane tire sizes, the tubes have practically been identical. The tendency at the present time, however, is to reduce the tube weights and wall thickness of the airplane inner tubes as far as compatible with economical performance.

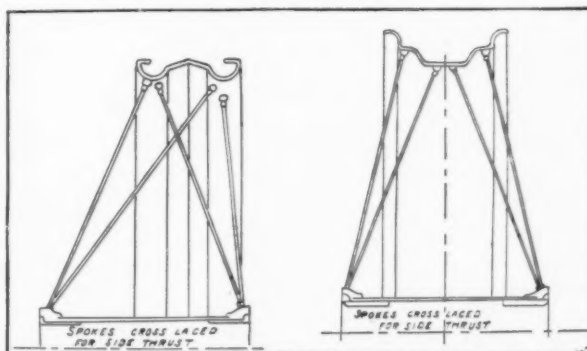
Airplane Wheels and Rims

Rim cutting was the commonest form of tire failure, as would be expected when the inflation pressures insisted upon at the time were 45 to 50 pounds. In addition to this the usual type of wheel, in which an offset hub was used, had a slight static eccentricity which contributed somewhat to aggravating the generally



Straightside Airplane Tire

the airplane by increasing the size of the power plant, increasing the weight of the equipment, or by increasing the weight of



Palmer Type

Airplane Wheels

Straightside Type

poor conditions. In order to reduce rim cutting to a minimum, it was realized that it would be necessary to hold the tire loading down to a reasonable limit. With this point in mind, inquiries

¹ Material Section, McCook Field, Dayton, Ohio.

directed to the various tire manufacturers elicited the information that a reasonable tire life could be expected if the tire deflection did not exceed 25 per cent when the airplane was at rest on the ground, considering 100 per cent deflection to be obtained when the wheel is running on the rim. This factor has been taken into consideration in limiting the designers to tire sizes as below.

WHEEL AND TIRE LOADING		Max. Allowable Plane Weight per Wheel Pounds
Size		
44 x 10.....		6,500
36 x 8 S. S.		4,000
900 x 200 Cl.		
800 x 150 Cl.		2,500
32 x 6 S. S.		
750 x 125 Cl.		1,800
28 x 4 S. S.		1,200
700 x 100 Cl.		
26 x 4 Cl.		1,000

In an actual weight analysis of a number of planes, it was found that a great many of the tires were overloaded, which explained in part their unsatisfactory performance. Following are a few of the actual cases found:

Name	Type	Wt. Per Wheel Pounds	Tire Size	Recom- mended Weight Pounds
Thomas Morse.....	Single Seater.....	687	26 x 3	600
Curtiss JN 4.....	Two place.....	1,025	26 x 4	1,000
SE-5.....	Single Seater.....	1,030	26 x 4	1,000
Oreco.....	Single Seater.....	1,300	700 x 100	1,200
DH-4.....	Two place.....	2,000	750 x 125	1,800
USD-9-A.....	Two place.....	2,400	750 x 125	1,800

Some of the above are not overloaded to any material extent with the exceptions of the DH-4 and the USD-9-A, with which most of the tire trouble was experienced.

In addition to this fact of overloading, it was felt that other contributing causes to tire failure were:

1. The offset hub type of wheel.
2. Clincher tires at low inflation pressures.

The offset hub type of wheel is what is known as the Palmer wheel, a diagram of which is shown. This wheel has several good features, such as exceptional stiffness of the rim due to the contour used; and excellent cross bracing of spokes for resistance to side thrust, which is of much more importance in the case of airplane wheels than in the case of automobile wheels.

In the writer's opinion, however, it has two very bad features; first, the support of the tire bead is not sufficient; and second, the wheel is statically slightly eccentric. It is believed that both of these factors contribute materially to aggravate rim-cutting conditions.

Straightside Tires and Wheels

A general survey of the wheel and tire situation indicated that improvements could be made in the design of both these materials, and the natural alternative was the straightside type. A discussion of the clincher versus straightside tires has been exhaustively treated in connection with the manufacture of automobile tires, and while the conditions are essentially the same, they are considerably more aggravated in the case of airplane tires.

Another consideration in favor of the adoption of straight-side tires is ease of handling. A clincher tire is not easy to mount even on small sizes, and with the larger sizes, it is extremely difficult. It has been noted that often three men are necessary to properly mount a 900 by 200 mm. clincher tire on a rim, while in the case of the straightside, one man can very readily mount even the largest size tire. The time required for mounting the straightside tires is also considerably less than that required for the clincher.

In view of all these difficulties experienced in the operation and maintenance of clincher tires and wheels in the field, a program of straightside wheels and tires was laid out which incorporates, it is believed, all of the good features and eliminates the bad

features of the clincher type. In laying out the program, consideration was given about as follows for the design of the new wheels for this type of tire.

RIMS. A one piece rolled rim with a drop center was chosen for lightness, simplicity, and ease of manufacture.

LACING SPOKES. A type of lacing should be used which would permit of cross bracing for side thrust as far as possible.

HUBS. The hub should be centered to overcome any eccentricity due to offsetting the hub in bracing for side thrust.

The sizes included in these changes were 3, 4, 5, 6, 8, and 10-inch tire sections, while the wheel was kept constant in all cases at 20 inches diameter. A diagram of the new straightside type wheel is shown on the preceding page.

TIRES. The only difference in the construction of the clincher and the straightside airplane tire is in the nature of the bead. In the case of the clincher tire, a soft bead is used as would be expected, and in the case of the straightside tire, a hard bead of fairly heavy wire is used, the necessity of which can be seen after a consideration of the contour of the rim for the straight-side tire. In both the clincher and the straightside tire, the carcass is very light, varying from four to six cord plies in practically all sizes. The tread is also very light, being only $\frac{1}{8}$ -inch thick in all cases. No cushion or breaker strips are used on any airplane tires of either type.

The tire bead of a straightside tire can also be more satisfactorily tied in than that of a clincher tire. A great deal of the tire trouble experienced with clincher tires can be traced to this one very important point of bead tie in.

This completes the first main division of rubber materials used in airplane construction. Description of the other groups of rubber products will follow in subsequent issues.

EXCISE TAXES ON SALES OF RUBBER PRODUCTS

Regulations regarding excise taxes on sales by rubber and tire manufacturers have been issued for 1922 by the Commissioner of Internal Revenue, Treasury Department, Washington, D. C.

The following rubber products are taxable at the rate of 5 per cent of the price for which sold by the manufacturer unless sold for resale to a manufacturer of automobile trucks, automobile wagons, other automobiles, motorcycles, tires, tubes, parts, or accessories, when they are tax free:

Belts, fan; bulbs, horn; cables, automobile assembly; caps, hard rubber radiator; collars, post; fillers, bead; flaps, motorcycle mud-guard; flaps, tire; gaskets; grips, rubber, motorcycle handlebar; handles, hard rubber controller lever, or gear shift handles; hose, radiator (taxable only when cut to length); mats and matting, rubber, for automobiles (taxable only when cut to size and shape); mats, motorcycle side-car (taxable only when cut to size and shape); mats, motorcycle, rubber pedal; mica and similar powders (not taxable when sold separately; taxable when sold as part of a complete repair kit); patches, blow-out; patches, inside protection (taxable where vulcanization not required; non-taxable where vulcanization required); patches, outside protection, or boots; patches, self-curing; patches, valve (taxable where vulcanization not required; non-taxable where vulcanization required); plasters (taxable where vulcanization not required; non-taxable where vulcanization required); plastic; repair outfits, tire and tube (where consisting of complete repair outfit, taxable; where consisting of fabric and rubber only without cement, not taxable); reliners (taxable where vulcanization not required; non-taxable where vulcanization required); rubbers, motorcycle pedal; rubber, channel, for windshields (taxable only when cut to length); rubber, strip, for windshields (taxable only when cut to length); wheels, hard rubber covered automobile steering.

"CRUDE RUBBER AND COMPOUNDING INGREDIENTS" should be in the library of every progressive rubber man.

Can the Small Manufacturer Survive?

Large and Small Plants Compared—Modern Plant Layout—Operating Personnel—Cost of Raw Materials—Product Distribution—Financial Status

SPECULATION has been rife during the last two years as to what will be the trend of tire and tube and other rubber manufacturing in the way of organization during the next decade. Some experts claim that the tire manufacturers must go through the same period of consolidation that the automobile industry is passing through; namely, amalgamation of the larger companies and either absorption or elimination of the small manufacturer. On the other hand, there are those who claim that the small tire plant or unit is the most economical and profitable and that the future will see the passing of the larger interests. This viewpoint is perhaps the more interesting of the two because on the face of it there seems little to support it.

It is the purpose of this article to analyze in a general way from statistics easily available, the possibilities of conducting a small tire plant at a profit, and the problems that must be solved in successful competition with the larger interests. By the small tire plant is designated those plants scattered over the United States the output of which is 500 casings a day or less, for of the 200-odd tire manufacturers it is estimated that at least half fall into this class.

Large and Small Plants Compared

For the first consideration, the large tire plant seems to have a distinct saving in cost in the matter of overhead, especially as applied to indirect labor, or executives. In the larger organizations the foremen supervise much larger units of men, but this is very often offset by the number of executives higher up who form a very complex organization.

Control of quality is often more effective in the smaller plant, as the foremen of the departments with a lesser number of operatives to supervise, can concentrate their efforts so that very little poor workmanship gets by. The larger plant may have more inspectors, but they are usually men of lesser responsibilities and training. On the matter of technical advice, on chemical and engineering problems, the large plant has all the better of it and is usually way ahead of the small one on new methods, labor-saving devices, and improvement of compounds. The small plant is usually located in an isolated district and for that reason may have a smaller labor turnover than the plant located in the rubber district where there are wage dissensions, etc.

It has been said that with the control of the quality of tires still more or less of an uncertainty, the large plant is more apt to produce uniform tires because the average of so large a number would be up to specification. This would certainly be truer of a large plant where all one size was manufactured than of a small plant where all sizes were produced. Specialization generally augurs for uniformity and quality.

It is in the field of distribution, however, that the large tire company has its greatest advantage. First, it makes for original equipment and obtains thereby a tremendous wedge in advertising and continuous production in the plant. Secondly, the large plant is able through national advertising and national distribution to keep the name of its product before the public constantly.

Purchase of raw materials might have been said to favor the large manufacturer back in 1919-1920, when he was able to sign up long contracts and obtain credit denied to the small tire plant. This proved a boomerang as soon as the depression came, however, as it left the small manufacturer first in the field to buy 15-cent rubber and 60-cent cotton, while the big interests were tied up to high-priced commitments for several years.

Modern Plant Layout

In estimating the conditions of tire and tube building on a small scale, it is proposed to refer to an article on "A Modern Tire Plant Layout," in *THE INDIA RUBBER WORLD*, July 1, 1920, which furnishes a diagram of a new tire plant with a capacity of 288 tires and 500 to 600 tubes per day as it stands. It is also stated that 2,000 tires per day could be produced in the same building, but this will be disregarded and all subsequent figures based on the initial production.

The plant and equipment cost approximately \$840,000 and is summarized as follows:

Buildings

Main factory building is modern throughout with complete sprinkler system, plumbing and wiring. Heavy fireproof construction, reinforced concrete and brick. This building is comprised of three floors, 280 feet by 80 feet, with a basement 60 by 80, giving a floor space of 72,000 square feet. Two elevators. A spreader and cement house constructed of reinforced concrete and brick, sprinkler system and fireproof with a floor space of 300 square feet.

The administration building is two stories in height and connected with the factory building with a bridge. It contains eight private rooms as well as the general office. Hot water heat and very light.

The main factory building is so constructed as to have two additional floors built on, with sufficient ground space for further expansion.

Power Plant

- 2 210 H. P. Boilers, with automatic ash conveyor.
- 1 130 K. W. Generator Set.
- 1 50 K. W. 2-Unit 5-Bearing Motor Generator Set.
- 1 Combined Feed-Water Heater and Meter Complete.
- 1 Horizontal Cast Iron Storage Tank.
- 1 10-5-12 Horizontal Duplex Boiler Feed Pump.
- 1 Booster Pump with 20 H. P. Motor.
- 1 Turbine-Driven Pump for Heating System.
- 1 Heating-System Auxiliary Circulating Pump with 10 H. P. Motor.
- 2 200 K. V. A. 6600/440-volt, 60-cycle, single-phase Transformers.

Equipment

- Air Compressors, Accumulator, etc.
- 1 Fabric Dryer with 3 H. P. Motor.
- 1 Insulating Machine with 5 H. P. Motor.
- 1 Tread Tubing Machine with Friction Drive.
- 1 Steam Platen Press with Manifold Pipe and Fittings.
- 1 Mixer with 75 H. P. Motor and Fittings.
- 2 Washers and Crackers with 75 H. P. Motor and Control.
- 1 Dry Kiln with Temperature and Humidity Controls.
- 2 2-64 inch Roll Calenders and 2 90 H. P. Heavy Duty Motors.
- 3 60-inch 2-Roll Mills in a series with 250 H. P. Motor and Control.
- 3 200 Gallon Churns.
- 1 72-inch Single End Spreader.
- 2 Cross Wrapping Lathes.
- 1 Horizontal Vulcanizer Complete.
- 1 Bias Shears (Birmingham).
- 2 Heaters, 48-inch by 12-inch by 16-inch Ram with Temperature Control Devices.
- 1 Slitting Machine.
- Various Tables, Books, Trucks, Scales, Shells, Mandrels, etc.

If this plant were operated at capacity for one year of 268 working days, which makes allowance for 52 Sundays, 26 days for Saturday afternoons, 8 holidays, and 11 days for shut-downs, it could produce 77,184 tires and 187,600 tubes. Figuring the net sales value of this product, by deducting 40 per cent from the consumer's list price of four of the large tire manufacturers, the figures show \$1,911,054.40 as the net value of a year's production at the factory. In deducting 40 per cent from this so-called consumer's list, a little explanation is necessary. This does not mean that the dealers do business on a margin of 40 per cent. Most tire companies today sell to dealers at so much off list, which

is an arbitrary schedule, the dealer reselling at whatever margin of profit his competition and cost of doing business warrant. It is doubtful if a dealer can do business on much less than 15 per cent which means he allows his customers to purchase at 25 per cent off the list. This figure, \$1,911,054.40, then represents what the factory receives for a year's production.

Operating Personnel

To man this plant, it is estimated twenty salaried executives would be required as follows: president and owner, salary, \$25,000 per year besides his share of the profits as accrued through dividends; general manager, \$10,000; sales manager, \$7,500; superintendent, \$6,000; general foreman, \$4,000; office manager, \$3,500; paymaster, \$3,000; purchasing agent, \$3,000; cost accountant, \$2,400; employment manager, \$2,200; plant engineer, \$4,000; central stores, \$2,400; calender room foreman, \$3,500; cutting, \$2,000; night and day shift building foremen, \$2,500 each; tube foreman, \$2,200; three curing foremen, \$2,000 each; total, \$92,700. Direct labor, including clerks and office help, would require 150 employees with a total pay-roll of \$225,000 per year. This is figuring tire builders at \$6 to \$7 a day, and general labor at 35 to 40 cents an hour.

Cost of Raw Materials

The next item is the cost of raw materials consumed in the manufacture of tires and tubes. Recent figures from The Rubber Association show 15,550,213 pounds of crude rubber consumed in the manufacture of 2,055,134 tires or 7½ pounds per tire. Similarly 2,343,393 tubes consumed 3,859,993 pounds of crude or 1.7 pounds per tube. Using these figures as indexes and pricing the rubber at 15 cents a pound, the total cost of crude for the manufacture of 77,184 tires and 187,600 tubes would be \$134,640.

Rubber Association reports on cotton consumed show 7,705,724 pounds used in 2,055,134 tires or 3¾ pounds per tire. Using this index, 77,184 tires would consume 289,440 pounds of cotton, which, when priced at 60 cents per pound (average of combed and carded Egyptian and American), would make the cost \$173,664.

Estimating the crude rubber used as 60 per cent of the compound on the average, it leaves 598,400 pounds of compounding ingredients, which when priced at 20 cents a pound (a high average) yields \$119,680. Miscellaneous materials can be roughly estimated at \$100,000. They include such items as bead wire, wrapper and liners consumed, valve parts for tubes, airbags, cartons, cases, wrapping paper, inner tube transfers, emery paper, brushes, brooms, various small tools and accessories. Freight inward is included in this item.

Product Distribution

It may be advisable, here, to explain briefly how the production of 288 tires is divided into the various sizes. These figures are based on the manufacture of cord tires, with the exception of the 30 by 3½ and 31 by 4 clincher sizes which are also made in fabric. The distribution is made according to the percentage of each of the standard sizes made by the group of manufacturers who report their production, inventory, and shipments by sizes to The Rubber Association. This may be a trifle inaccurate for the small manufacturer as he is less able to compete with the large plant on the small sizes, and very often the small plants specialize on the larger sizes. So it may be said with some accuracy that the figure of \$1,911,054 for a year's production at 288 tires per day may be low for a small plant.

Adjustments and depreciation due to seconds is figured at 5 per cent to cover both items. If a small plant is operated efficiently and is turning out a quality tire which it must do to compete with the large plant and overcome the handicaps of distribution, this figure should be ample. It figures \$95,552.72 per year.

Financial Status

The next cost items concern the financial status of this fictitious company that interest charges, etc., may be estimated. Capital

of \$1,000,000 is figured necessary to finance this tire plant, and is divided into \$750,000 preferred stock, and \$250,000 common, the preferred being 7½ per cent cumulative. In addition to this paid-in capital, \$400,000 is borrowed on notes at 8 per cent. The subject of charging interest on capital as part of the cost of production has been much debated, but is now generally accepted as incorrect in principle because the capital employed by the managers in the venture cannot earn two kinds of income, that is, interest and profit. Therefore, the only interest charge entered on this cost of operations will be the interest of \$32,000 on the \$400,000 notes.

Depreciation on the plant and equipment is figured on the cost of the plant, \$840,000, which will be assumed to be high owing to its erection in the peak period after the war. Estimating the life at 25 years, \$33,600 per year will be the depreciation charge.

Taxes and insurance are estimated at \$40,000, and power, heat, light, and water at the same figure.

This makes the total manufacturing cost \$1,086,836.72 or 57 per cent of the gross sales. Out of this 43 per cent margin must come, first of all, the selling expense. This includes a large number of items, namely, salesmen's salaries, commissions, and traveling expenses; advertising expenses such as road signs, postage, printing, newspaper and magazine advertising; freight outward; discounts, etc. It is conservatively estimated at 25 per cent or \$477,763.

Cumulative preferred dividends make a charge of \$56,250, leaving a net balance of \$290,204.68 available for dividends on common stock before profits and taxes.

Thus these estimated fictitious figures show that the small tire plant can be operated at a substantial profit. Probably very few plants of the size mentioned herewith show as large a profit as the one described, however. In order to accomplish the above results the company must have a very efficient sales as well as manufacturing organization, for unforeseen difficulties in either branch of the business would soon upset the balance sheet. The small plant has one element in its favor which does not show up on the balance sheet but which helps materially in eliminating the "red ink." It is the human element in the organization which very often becomes lost in huge, complex organizations. The *esprit de corps* usually fostered by the sprinkling of young men through the personnel guided by men of experience is a great asset. Small tire plants are usually controlled by one or two forceful men who build round them a loyal group of workers who overcome many obstacles. Politics and "wire-pulling" very seldom develop in such companies and they are great benefactors by their absence.

The annual balance sheet of this tire company might read:

BALANCE SHEET			
Assets		Liabilities	
Cash	\$190,000	Common stock.....	\$250,000
Land, buildings, machinery, equipment	840,000	7½% cumulative pfd....	750,000
Goods in process.....	100,000	Accounts payable	250,000
Finished goods.....	400,000	8% notes.....	400,000
Accounts receivable.....	325,000	Reserves for depreciation	67,200
		Surplus	137,800
Total	\$1,855,000		\$1,855,000

Statement of income and profit and loss follows:	
PROFIT AND LOSS STATEMENT	
Gross sales.....	\$1,911,054.40
Cost of Sales	
Indirect labor.....	\$92,700.00
Direct labor.....	225,000.00
Material:	
Cotton	173,664.00
Rubber	134,640.00
Compounds	119,680.00
Miscellaneous materials, freight, etc.....	100,000.00
Adjustments, depreciation on seconds, returns, etc.....	95,552.72
Reserve for depreciation	33,600.00
Interest on \$400,000 bonds.....	32,000.00
Taxes and insurance.....	40,000.00
Power, heat, light, water.....	40,000.00
Selling expense.....	477,763.00
Preferred dividends.....	56,250.00
Surplus before taxes.....	290,204.68
Total	\$1,911,054.40

Other income such as sale of waste materials or other by-products might possibly be included but on the present market such income barely covers the cost of handling, so that no net income would be recorded. Also provision might be made out of the surplus for doubtful accounts, depreciation of good will, and organization expense.

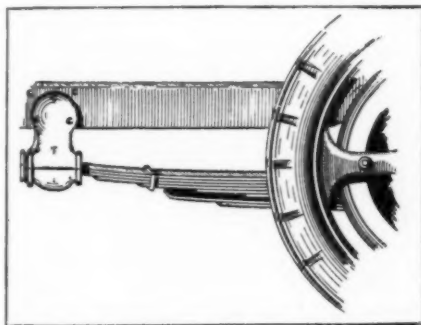
What Constitutes a Perfect Motor Bus¹

The author states that the controlling design factors for the motor bus are: (1) safety, (2) comfort and convenience of the public, (3) minimum operating cost. These features were thoroughly treated from an engineering standpoint. The important feature of rubber in tire and spring equipment was adequately summarized from actual experience.

Rubber in Bus Design

Mention of rubber in the design of buses was as follows:

Regarding the rear truck, the outer edge of the tires should closely correspond to the extreme overall width of the body and the rear springs should be as close to the tires as practical. This is shown in the accompanying illustration.



Mack Type Rubber Shock Insulator

The braking action must be positive yet not sudden and violent, for such a condition is exceedingly severe on the driving members, tires, and body. Excessively efficient brakes have a most marked influence on tire wear. It may be said that tire wear is almost directly proportionate to the effectiveness of the brakes.

Standardized Rubber Shock Insulator

For single-deck equipment the Fifth Avenue Coach Co. has standardized the Mack type rubber shock insulator². Experiments are in progress with this device for double-deck vehicles, but results as yet are not announced.

This arrangement, in conjunction with the progressive spring system, markedly improves the riding conditions. It also avoids the necessity for lubrication and for replacement of shackles, shackle pins and bushings; also, no spring eyes are required. Experience up to the present shows that a very satisfactory life may be expected from rubber blocks.

Data on Tire Service Costs

In the earlier days of bus operation the tire question was one of the chief anxieties. Today the situation is very different, for wonderful improvements have been made in tire manufacturing methods. Of course, there is no sense in decreasing tire expenditures at the cost of the equipment generally. Resilient tires are essential and too great a wear must not be permitted. It is the regular practice to remove a tire immediately the rubber has worn to within $\frac{3}{8}$ -inch of the hard base.

In looking back over the records, it is extremely interesting to note that in 1911 the cost per mile for tires was 4.93 cents. From that date on, a steady reduction has been effected. The figure for 1921 was 0.87-cent per mile, and this, of course, includes the use of six tires. The various factors which have permitted this condition to be reached are, in order of their importance, as follows:

1. Better tire manufacturing methods.
2. Improved vehicle design. This includes decreased weight, particularly unsprung weight, the substitution of metal for wood wheels, etc.
3. Closer supervision from an operating standpoint.
4. Closer supervision from a maintenance standpoint.

As the result of long experience in connection with the design, construction and operation of buses, it is evident that trucks or automobiles, modified or unmodified, are absolutely incapable of giving satisfactory and economical service if operated as buses. The tendency today is to employ trucks or automobile chassis as buses, or to attempt to modify their construction, then to rechristen them. This is a dangerous policy from the standpoint of both the builder and the user, and eventually it must surely result in dissatisfaction and disillusionment to all concerned.

"REX-BLAK"

A most disagreeable feature of the use of dry carbon black in rubber compounding is its tendency to float all over the mill room and make the place unendurable. Carbon black is prepared in special form known as "Rex-Blak," which contains rubber, carbon black and glue made up in proportions to suit given requirements. In compounds containing a large percentage of carbon black 25 per cent in power consumption can be saved, it is claimed, and mill room production increased 25 to 30 per cent. Owing to the perfect dispersion of carbon black throughout the stock, tensile strength will be increased and better tubing properties will also result.

TUFFITE AND TUFFINE

The reports of the practical value of the use of the mineral filler Tuffite and the related accelerator Tuffine show some very interesting results. For example, three air bags containing these ingredients gave vulcanizing service, respectively, of 238, 284, and 300 curing hours.

In rubber steam packing these materials have proved of such exceptional heat-resisting value as to suggest their utilization in compositions designed for steam hose tube, cover and friction and other purposes where rubber products are subject to severe service conditions.

HERMANN TIRE BUILDING MACHINE CO.'S NEW PLANT

Increasing demands for the special machinery produced by The Hermann Tire Building Machine Co., Columbus, Ohio, have made it necessary for this organization to have its own manufacturing plant. Accordingly, the A. R. McDonald machine shop at St. Marys, Ohio, has been recently purchased, and equipment is being forwarded from Columbus to St. Marys.

A subsidiary organization, The Hermann Manufacturing Co., is being formed, with the following as incorporators: W. H. Hermann, president and treasurer; F. Stanley Crooks, vice-president; E. H. Bocker, secretary, and O. E. Larson, plant manager. Mr. Larson, who was formerly superintendent of the Columbus Tool & Die Co., will have as his associate Howard Taylor, both being men of wide experience and technical training.

While this new organization will devote its plant primarily to the building of the Herman machines, it is the intention to manufacture other equipment for the tire trade, as well as all kinds of special machinery.

¹Abstract of paper by G. A. Green, general manager, Fifth Avenue Coach Co., New York, N. Y.

²Rubber Shock Insulators for Buses, THE INDIA RUBBER WORLD, November 1, 1921, pages 115-116.

Proposal for an International Plantation Rubber Company

The following plan for cooperation between the plantation rubber industry and American financial interests is submitted by one connected with extensive plantation interests in the Far East and with large rubber manufacturing interests in the United States.

(1) Rubber Plantations, Ltd., to be formed, registered in London, with an authorized capital of £50,000,000, or such figure as may be determined later.

(2) The corporation to acquire, by purchase, or otherwise, estates or interests in estates in each of the rubber growing countries, direct or through holding companies of British, Dutch, Belgian, American or other nationality.

(3) The shares of the corporation—or certificates representing such shares—to be listed on the exchanges of London, Amster-

dam, Antwerp, New York and such other markets as may be determined later.

(4) Estates to be operated through agents as at present, with possible regrouping of interests to secure efficiency and economy. Should any agents, directors or secretaries be affected by such regrouping, their services to be utilized wherever possible; otherwise, compensation to be given them.

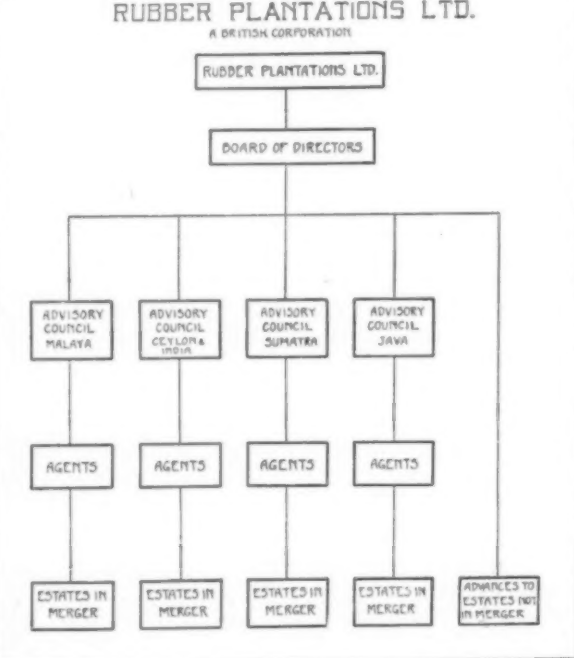
(5) A syndicate to be formed to provide funds to meet the requirements of the industry. Participation in such financing to be open to capital of all nationalities interested.

(6) Estates to be taken into the corporation on a basis of valuation by a committee on which the syndicate is represented.

(7) The corporation to issue to the syndicate such form of security as may be determined by mutual agreement.

(8) The corporation to advance funds, on mutually satisfactory terms, to estates not taken into the combination.

(9) Representation upon the board of directors to be given to each national interest.



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(8) The corporation to advance funds, on mutually satisfactory terms, to estates not taken into the combination.

(9) Representation upon the board of directors to be given to each national interest.

(10) The board of directors to appoint advisory councils in

the various rubber growing countries, to include heads of agencies, planters, financial representatives, and such other members as may be desirable.

(11) The corporation to take steps to secure authoritative figures on supply and demand.

(12) Representatives of the plantation rubber industry to be appointed to attend a conference with American interests, including rubber manufacturers, for discussions relative to the present and future potential surplus of rubber.

(13) Subject to such measures as may be mutually agreed upon for the disposal of surplus stocks, the present channels of distribution of product to remain undisturbed.

Advantages of Cooperation

Among the advantages which would be secured through such a combination are the following:

(1) International market for securities.

(2) Formulation of policies affecting output and surplus stocks.

(3) Scattering of risks from diseases and pests, winds, floods, deterioration of trees, etc.

(4) Reduction in costs through economies of large scale management.

(5) Centralized administration of labor.

(6) Benefits to manufacturers and planters through large scale production of a uniform product under new processes as developed.

(7) Organized campaign for extension of present uses of rubber and stimulation of new uses.

(8) Maintenance of efficient research and statistical departments to secure accurate knowledge of progress in all phases of the industry.

(9) Stabilizing influence in the industry.

SUPARAC ACCELERATORS

A new vulcanization accelerator of English manufacture is prepared in two grades, "Suparac," standard, and "Suparac" Z. The activating agent is identical in both. They are made by synthesizing a carbon bisulphide derivative of an organic base such as piperidine, upon a carrier such as colloidal clay, zinc oxide, French chalk, light carbonate of magnesia, or calcium carbonate.¹

As some ingredients activate and others slow the accelerator the time saving in curing with Suparac, using half the usual amount of sulphur, is said to be from 90 to 95 per cent with two per cent of the accelerator, calculated on the rubber, and from 50 to 80 per cent with one per cent. In the case of the Z grade, the time savings are similarly 90 to 95 per cent with four per cent accelerator, 66 to 80 per cent with two per cent, and 50 to 66 per cent with one per cent.

¹ Schidrowitz and others. British patent No. 170,682. THE INDIA RUBBER WORLD, February 1, 1922.

PENDARE A SUBSTITUTE FOR RUBBER?

A latex-giving tree, known as "pendare" and similar in many respects to balata, is found in the eastern sections of Venezuela. These trees reach a height of 40 to 50 meters and are found in abundance in the mountains of Imataca; in the Federal Territory Delta-Amacuro; in the Piacoa range, a branch of the Imataca range; and along the banks of the Barima and Amacuro rivers. The territory now receiving the most extensive exploitation is in the state of Bolivar.

The latex is converted by a boiling process into chicle and the resulting solidified balls are called "plancha." Balata latex is often mixed with that of the pendare, the product being then of lesser value. The principal center of the trade is at Ciudad Bolivar, where it brings an average of 60 bolivars for 46 kilograms. The freight to points of exportation is approximately 20 bolivars for 46 kilograms, and from Ciudad Bolivar to New York is \$10 for 46 kilograms.

Carded Peeler Fabrics for Low Price Tires

TIRE manufacturers in their efforts to develop the most economical fabric for producing what they term the "balanced" tire have employed various staple lengths of cotton and tensile strengths of fabric, as a basis of judgment. However, actual performance as shown by road tests is after all the only true basis of determining what fabric is most efficient and economical for any particular type and quality of tire to be manufactured.

Obviously, if the fabric used is capable of greater mileage than the tread rubber, sidewalls or beads, the tire is not well balanced. If the fabric is unnecessarily good, waste results and mileage is not in proportion to cost. This applies to a tire of the highest quality or one to sell at a low price.

Length of cotton staple is only a partial and a very unreliable guide to the value of any tire fabric. Experts often disagree to the extent of 1/16 to 1/8-inch in stapling cotton samples, and it is almost impossible for the layman to judge tire fabric on representations regarding the length of staple or on examination of the cotton after it has been spun and woven into fabric.

Of the principal characteristics of a good tire fabric, tensile strength is perhaps the least important. This is particularly true of cord fabric, the essential requirements in which are elasticity and resiliency, neither of which depends on tensile strength or length of staple. As the demand is now chiefly for cord tires, this matter is worthy of due consideration.

Tire fabric manufacture is a highly specialized business and in the long run tire companies can more safely depend on the advice of reputable fabric manufacturers than rely entirely on their own often imperfect judgment. Leading fabric manufacturers are experienced in selecting the right grades of cotton as well as processing them properly and take pride in maintaining the reputation they have established for integrity and fair dealing. What they have already accomplished in cooperation with tire manufacturers is much to their credit and deserves summarizing here.

In the early days of the tire industry the fabric was the best material entering into tire construction, for it often had to make up for the deficiencies of poor rubber compounds, faulty engineering features and unskilled construction. Combed extra to fancy Sea Island cotton of extra staple only was used. When this supply became inadequate, combed Egyptian came into use, at first the very costly extra quality from the lower Delta of the Nile, and later the less expensive cotton grown in the upper Nile Valley. Although somewhat shorter in staple and coarser in fiber, the latter is satisfactory and has come into common use for weaving tire fabrics.

Until the World War our own extra staple cottons, grown in the Delta of the Mississippi River, were neglected. However, with the interruption of the Egyptian supply and the constant increase in tire demand, American tire fabric weavers were forced to use our own Delta cottons, commonly known as peelers. In length of staple the best grades are fully equal to upper Egyptian and experience proved them to be in every way satisfactory.

Meanwhile great advances had been made in tire design, rubber compounding and curing methods, manufacturing processes and machinery. Tire fabric stresses were relieved and requirements became less rigid. The best obtainable extra staple cotton was no longer necessary in order to deliver high tire mileage, and more recently high labor costs and keen competition have rendered urgent the need of every possible economy in tire manufacture.

At first combed peeler fabric was made of cotton having a staple about 1 1/4 inches in length. Later it was learned that extra staple Egyptian or peeler cotton, not combed but well carded, would produce an excellent tire fabric at quite a saving, due to

the elimination not only of expensive processing but of the waste produced by it. It may not be quite so clean and beautiful as combed peeler fabric, but it is equally serviceable. The analogy of whole wheat and bolted white flours may perhaps be fairly applicable by way of illustration.

Recently it has been found that a satisfactory tire can be made with a fabric produced from cotton of shorter staple than either the Egyptian or Delta varieties, and a fabric commonly known to the trade as carded peeler has been developed which in the present market sells at 16 cents per pound below combed Egyptian or peeler and 9 cents below carded Egyptian. With this fabric many efficient and well balanced tires are being made today that are delivering greater mileage than did the tires produced some years ago when only the best combed Sea Island cotton was used.

This has led to the prediction by some in the trade that five years hence very little long staple cotton will be used in tire fabrics. Certainly it is becoming apparent that the fabric standards of the past are unnecessarily high under present conditions. Much depends on the proper spinning of yarns for tire fabrics. It is obvious that long staple cotton yarn improperly spun may make a poorer tire fabric than properly manufactured yarn produced from cotton of shorter staple. Hard twisting produces a brittle yarn. A yarn of as soft twist as is consistent with minimum strength requirements imparts to the fabric those qualities of pliancy and resiliency which have been found to be more important characteristics of a tire than mere strength.

Finally the method of building up the tire carcass is a matter of the utmost importance. With the same fabric one manufacturer may produce a good and another a poor tire, depending chiefly on the evenness of tension in the several plies. Hand-built tires may vary considerably in this respect, but the now fairly general use of tire building machines, eliminating the human equation, renders even tension a certainty. It is these building machines as much as better tread compounds and curing methods which are making possible the successful use of our ordinary American cottons in tire manufacture.

MERGER OF TWO IMPORTANT COMPANIES

The Schaeffer & Budenberg Manufacturing Co., with works and general offices in Brooklyn, New York, and the American Steam Gauge & Valve Manufacturing Co., of Boston, Massachusetts, have merged.

These two companies, while operating as one, will continue the manufacture at their respective plants of their various instruments for measuring pressure, temperature, power, speed, etc. The Schaeffer & Budenberg company retains its full original title, while the American Steam Gauge & Valve Co. becomes a "division" of the Schaeffer & Budenberg organization.

These organizations, manufacturing somewhat similar products, have a history that is strikingly parallel. The Schaeffer & Budenberg Manufacturing Co. was founded in 1850, the American Steam Gauge & Valve Manufacturing Co. a year later. Both concerns, through the production of standard equipment, have gone steadily forward, and have become well known in the technical world. The general offices will be maintained at Berry and South Fifth streets, Brooklyn, New York.

"PNEUMATIC TIRES," "CRUDE RUBBER AND COMPOUNDING INGREDIENTS," and "RUBBER MACHINERY," by Henry C. Pearson, cover these subjects in a comprehensive and authoritative manner. They should be in the library of every progressive rubber man.

A. C. S. Rubber Division Program

Plans have been prepared by the various sections of the American Chemical Society for the fall meeting, which will be held in Pittsburgh, Pennsylvania, with the Pittsburgh Section, September 4 to 9, inclusive. An interesting program, arranged by the Rubber Division for its special session, is as follows:

Committee Reports:

Executive. C. W. Bedford, chairman.
Accelerator. J. B. Tuttle, chairman.
Physical Testing. C. O. North, chairman.
Discussion of "Methods of Research Testing." Committee.
"Analytical Standardization." S. Collier, chairman.

Dr. O. de Vries. "American Conclusions Regarding Crude Rubber." By title.

John B. Tuttle. "Chemical Reactions of Sulphur Terpenes with Rubber."

H. A. Winkelmann and Harold Gray. "Studies in Vulcanization, Mechanism of the Acceleration of Vulcanization by Zinc Ethyl Xanthogenate."

D. F. Cranor. "Effect of Certain Tread Pigments on Temperature Developed in Pneumatic Tires."

Winfield Scott. "Disubstituted Guanidines."

W. W. Vogt. "Studies in Hysteresis of Rubber Compounds."

Ira Williams and D. J. Beaver. "Thermal changes during Vulcanization."

Frank G. Breyer. "Zinc Oxide in a New Physical Condition—Its Effect upon Rubber Compounds."

C. W. Bedford and Harold Gray. "Reaction of Accelerators during Vulcanization. V. Dithiocarbamates and Thiuram Disulphides."

Erle C. Zimmerman. "A Method for the Measurement of Resistance to Tear in Vulcanized Rubber."

Harlan A. Depew. "Results of Variation in Sulphur and Hexamethylene tetramine Content or some of the Properties of Compounded Rubber."

Harlan A. Depew. "An Abrasion Testing Machine for Rubber Samples."

W. E. Glancy. "The Influence of Certain Compounding Ingredients in Hard Rubber."

W. R. Hickler and W. E. Glancy. "A Convenient Nomograph for Rubber Chemists."

P. M. Aultman and C. O. North. "Rubber Softeners."

Ellwood B. Spear and J. F. Purdy. "The Measurement of Temperature in Rubber Articles by means of Thermocouples."

Ellwood B. Spear and H. A. Endres. "The Limitations of the Obscuring Power Test for Compounding Materials."

Herbert A. Endres. "The Crystallization of Sulphur in Rubber and the Phenomenon of Blooming." Lantern.

A. F. Hardman. "The Microscopic Examination of Rubber Containing Antimony Pigments." Lantern.

H. W. Greider. "The Resilient Energy and Abrasion Resistance of Vulcanized Rubber." Lantern.

W. B. Wiegand and H. A. Braendle. "Persistence of Calender Grain after Vulcanization." Lantern.

L. B. Sebrell and C. E. Boord. "A Study of the Relation of the Structure of Mercaptobenzothiazole and Its Derivatives to Their Value as Accelerators of Vulcanization." Lantern.

Election of officers.

Following the election of officers the analytical committee will present its final report, and all members are invited to offer criticisms or suggestions. Dr. de Vries has also tabulated his replies to questions asked by rubber chemists at the last session, and the presentation of his conclusions will form an interesting feature of a program which is a varied one, and of unusual importance.

Exhibitions and Conventions

Exhibitions

Sept. 4-9—Indianapolis, Automobile and Accessory Show in conjunction with the Indiana State Fair.
Sept. 11-16—New York, N. Y., Eighth National Exposition of Chemical Industries, Grand Central Palace.
Sept. 23-30—New York, Closed Car Show, Grand Central Palace.
Nov. 13-18—Chicago, Annual Show and Meeting of the Automotive Equipment Association.
Dec. 3-9—New York, Eighteenth Annual Automobile Salon, Commodore Hotel.
Jan. 6-13—New York, National Automobile Show, Grand Central Palace.
Jan. 27-Feb. 3—Chicago, Annual Automobile Show, Coliseum, and First Regiment Armory.

Conventions

Sept. 13, 14, 15—Buffalo, Annual Credit Meeting, Motor and Accessory Manufacturers' Association, Lafayette Hotel.
Oct. 26-28—Washington, Second National Conference for the Study of Highway Engineering and Highway Transport Education.

Textile Calendar

Oct. 4 and 5—Atlantic City, New Jersey, National Association of Cotton Manufacturers, Fall Convention, Hotel Traymore.
Oct. 19-25—Greenville, S. C., Southern Textile Exposition, Textile Hall.

Foreign Exhibitions

September, 1922—Rio de Janeiro, Brazil, Automobile Exhibits in Connection with the Brazilian Centenary Associação Automobílica Brasileira.
Sept. 15-20—The Hague, Automobile Show.
Sept. 25-Oct. 3—Berlin, Automobile Show at the Kaiser-Damm Hall under the auspices of the German Automobile Manufacturers' Association.
Oct. 1-15—Lyon, France, International Autumn Sample Fair.
Oct. 4-15—Paris, Automobile Show, Grand Palais.
Nov. 3-11—London (Olympia), Automobile Show.
Nov. 10-Dec. 19—Brussels, Automobile Show, Palais de la Cinquantenaire.
Nov. 29-Dec. 4—London (Olympia), Cycle and Motorcycle Show. British Cycle Motors, The Tower, Warwick Road, Coventry.
November—Buenos Aires, Argentina, Annual Exhibition, Automovil Club Argentino.

BRAZILIAN CENTENNIAL EXPOSITION OPENS IN SEPTEMBER

The Brazilian Centennial Exposition will open at Rio de Janeiro on September 7, 1922, and close on March 31, 1923.

Special passenger rates have been granted by the United States Shipping Board for the duration of the exposition. Their large new steamers, "The American Legion," "Southern Cross," "Pan-American," and "Western World," now make the trip to Rio de Janeiro in about 11 days.

Full data regarding the Exposition or concerning commercial opportunities in Brazil will be furnished, upon request, by the Latin American Division and the various commodity divisions of the Bureau of Foreign and Domestic Commerce, Washington, D. C.

TIRE MANUFACTURERS AND DEALERS CONFERENCE

A joint conference between committees representing The Rubber Association of America and the National Tire Dealers' Association was held August 9 at the New York headquarters of The Rubber Association.

The tire dealers were represented by R. F. Valentine, R. J. Walters, George J. Berger and Frank Zeman. The following represented the manufacturers: G. S. Shugart, United States Tire Co.; J. V. Mowe, Kelly-Springfield Tire Co.; Horace De Lisser, Ajax Rubber Co., Inc., who is acting as president of The Rubber Association in the absence of H. T. Dunn; W. O'Neil, The General Tire & Rubber Co.; G. A. Waddell, The Goodyear Tire & Rubber Co.; L. G. Fairbanks, Firestone Tire & Rubber Co.; E. H. Broadwell, The Fisk Rubber Co.; H. C. Miller, The B. F. Goodrich Rubber Co.; L. J. Plumb, Madison Tire & Rubber Co.; W. W. Duncan, Hood Rubber Products Co., Inc.; Harry Phelps, C. Kenyon Co.; and M. E. Clarke, counsel for The Rubber Association.

A report regarding this conference will later be issued by The Rubber Association.

"CRUDE RUBBER AND COMPOUNDING INGREDIENTS" should be in the library of every progressive rubber man.

What the Rubber Chemists Are Doing

Tests on Plantation Rubber with Zinc Oxide and Litharge Mixings¹

By H. P. Stevens

SOMEWHAT condensed, the author reports: Practically all tests carried out on plantation rubber on behalf of plantation interests have been made with a mixture of rubber with a relatively large proportion of sulphur and without any other ingredients. Such a mixture has the advantage of simplicity and of emphasizing variations in rate of vulcanization, and there are good grounds for its adoption. Tests with typical compounding ingredients are made by the larger manufacturers and a consignment of rubber which may give satisfactory results when mixed with one ingredient may give unsatisfactory results with another.

Zinc Oxide

Zinc oxide is one of the commonest ingredients of rubber mixtures. It has long been recognized as giving a desirable effect, although no explanation has been put forward to account for the result produced. Its effect is similar to that of a very finely divided substance, yet it is generally agreed that it is not so finely divided as would be expected from its behavior. Zinc oxide has usually been regarded as an inert material and normally is little changed during vulcanization.

Recent work appears to show that zinc oxide has a marked effect in increasing the efficiency of some organic accelerators, so that it is essential to employ a substantial proportion of zinc oxide when using these accelerators if reasonable advantage of their activities is to be obtained.

Litharge

The scheme of experiment was widened to include mixings made with a litharge, a well known inorganic accelerator, used in very large quantities. In many ways the behavior of litharge is unique. It is the only inorganic accelerator which enables rubber to be vulcanized in the air; that is, it protects the rubber from oxidation. The litharge, oxide of lead, is itself changed with the formation of lead sulphide. Litharge, therefore, uses up part of the sulphur added for vulcanizing, so that if the proportion of sulphur be limited there is competition between the litharge and the rubber for the sulphur, which enables a better control of the degree of vulcanization. It is difficult to overcure such compounded rubber.

The effect of litharge is profoundly modified by the caoutchouc constituents of raw rubber, particularly the acetone-soluble portion commonly referred to as resin. If rubber from which the resin has been removed be compounded with litharge, it will hardly vulcanize at all. If the extracted resin be replaced, satisfactory vulcanization ensues.

Rubber Resins

The main ingredient of the resin is a substance called inositol. If this substance be purified it does not restore the vulcanizing properties to the rubber from which the resins have been extracted. Hence, the active constituent of the resins is not the inositol, but some other substance.

It is obvious that the proportion of this other substance will vary in different rubber, and a measurement of the amount of acetone extract will not be a guide as to the amount present in different samples of raw rubber. Hence, different rubbers may give different results when vulcanized in the presence of litharge, while giving identical results in a mixture of rubber and sulphur only.

Test Mixings

Three mixings were used, as follows: (1) Rubber with excess of sulphur, rubber 90 parts, sulphur, 10 parts. (2) Rubber with excess sulphur and zinc oxide, rubber 90 parts, sulphur 10 parts, zinc oxide 5 parts. (3) Rubber with restricted sulphur and litharge, rubber 100 parts, sulphur 6 parts, litharge 7 parts.

Seven parts of litharge require one part of sulphur for complete reaction and conversion to lead sulphide and consequently, assuming the reaction complete, there will remain over five parts of sulphur for combination with 100 parts of rubber or about half the proportion used in the first two mixes.

The rubber used consisted of a series of samples prepared in slab form and coagulated with varying portions of acetic acid, sulphuric acid and alum. The mixtures were vulcanized in all cases for three hours at 138 degrees C., the load stretch curves and the coefficients being determined in the usual manner. In order to obtain elongation figures which would be comparable and include those with relatively high elongations, these figures were compared at a load of 60 kilos per sq. cm.

Effect of Zinc Oxide

Taking elongation at a given load for a nine to one rubber and sulphur mixture and the same mixture with the addition of zinc oxide the ratio remains the same for all specimens whatever the rate of cure.

If the coefficients be compared instead of the elongations, the ratio is no longer the same for all the specimens. In the presence of zinc oxide, the coefficients do not fall to the same extent as in a simple rubber and sulphur mixing, so that with very slow curing specimens, such as those produced with a large excess of alum, the coefficient of the rubber-sulphur compound is only one half of that containing zinc oxide.

Effect of Litharge

The ratio of elongation at a given load for the rubber-sulphur and litharge compounds is not constant as in the case of the zinc compounds. The elongation of the litharge compounds is less susceptible to reduction in rate of cure, as produced by excess of coagulant, than the rubber-sulphur compounds.

The coefficients are parallel with those of the zinc compounds but the reduction of the coefficient with increase of coagulant is more marked.

Comparison of Zinc Oxide with Litharge

Taking proportionality in rate of cure as modified by (1) addition of zinc oxide to the ordinary rubber-sulphur mixing, and (2) addition of litharge and reduction in the proportion of sulphur:

(1) Zinc oxide produces some modification mainly in regard to the coefficients, but the specimens fall into approximately the same order as in the rubber-sulphur mixings.

(2) Litharge produces considerable modification, and this applies both to the coefficients and elongation, and the specimens do not fall into the same order as in the rubber-sulphur mixings.

Effect of the Coagulant

The simple rubber-sulphur mixings are the most sensitive to change in nature or proportion of coagulant. The addition of a small proportion of zinc oxide, five per cent, modifies the results and reduces the differences shown, and litharge acts similarly but more powerfully. To illustrate by concrete figures from tabulated results, an excess of alum reduces the coefficient of a rubber-sulphur mixing from 5.22 to 1.35, but with the addition of seven per cent of litharge, a coefficient of 4.11 is reduced to 3.36 only. These figures illustrate the importance of specifying the formula and ingredients when referring to variation in rate of cure. To state that there is a variation of 10 per cent amounts

¹ The Bulletin of the Rubber Growers' Association, Vol. 4, No. 6, 1922, 275-281.

to little in the case of a rubber-sulphur mixing in the proportion of nine to one, but would be considerable if based on a mixing containing a small quantity of litharge.

Graphic Analysis of Sublimed White Lead¹

By Burton Paxton

With the increased use of sublimed white lead as a pigment has come a demand for a rapid method of analysis.

Early methods of analysis of this pigment required determination of ZnO, Pb and SO₃; calculation of SO₃ to PbSO₄ and residual lead to PbO. This was shortened by Schaeffer's method as given in Scott, "Standard Methods of Chemical Analysis." In this method the Pb and ZnO are determined and by means of formulas calculated to PbSO₄ and PbO.

Explanation of the Chart

The left-hand scale of the chart is graduated from 5 to 10, representing percentage of zinc oxide in the pigment. The right-hand scale is graduated from 65 to 70, representing total lead in the pigment. The two center scales are graduated in terms of lead sulphate and lead oxide. A line drawn across the chart connecting any point (a) on the ZnO scale with any point (b) on the Pb scale will intersect the center scales at percentages of lead sulphate and lead oxide contained in pigment having a per cent of ZnO and b per cent of Pb.

How to Use the Chart

To use the chart it is necessary to have percentages of Pb and ZnO in the pigment. These may be determined quite rapidly by volumetric method as follows:

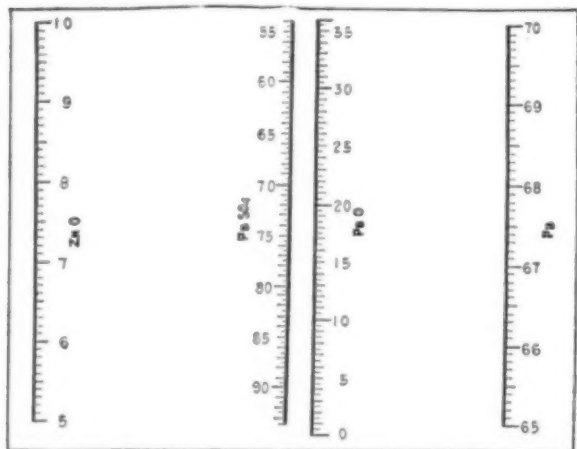


Chart for Analysis of Sublimed White Lead

For ZnO.—Boil 1 g. of pigment in 6 cc. HCl, 30 cc. H₂O and 5 g. NH₄Cl. Pigment will not all dissolve, but this has no effect on result. Dilute to 250 cc. with hot water, add a few drops of 10 per cent sodium sulphite solution and titrate with a standard solution of potassium ferrocyanide, using ammonium molybdate as an outside indicator. Ferrocyanide solution should equal 0.01 g. ZnO per cc.

For Pb.—Dissolve 1 g. of pigment in acid ammonium acetate and dilute to 200 cc. Heat to boiling and titrate hot with a standard solution of ammonium molybdate, using tannic acid as an outside indicator. Molybdate solution should equal 0.01 g. of Pb per cc.

Now lay straightedge across chart connecting percentage of ZnO on left-hand scale with percentage of Pb on right-hand scale. Intersection of this line with center scales will give percentages of

¹Chemical and Metallurgical Engineering, May 24, 1922, 989.

PbSO₄ and PbO. The sum of percentages of ZnO, PbSO₄ and PbO is, for all practical purposes, a constant, 99.7 per cent.

Using this chart, it is possible to make analysis of pigment in 10 or 15 minutes.

Chemical Patents

The United States

REFINING LAMPBLACK. Crude lampblack is boiled in an alkaline liquid, and the product heated with sulphuric acid until it thickens to a paste, when it is added to a saline solution.—C. F. C. Herting, Berkeley, California. United States patent No. 1,416,955.

COMPOSITION FOR TREATING MANUFACTURED RUBBER. A composition containing a larger portion of phenylamine and a smaller portion of cotton seed oil.—Rhetherford B. Martin, New York, N. Y. United States patent No. 1,422,115.

PROCESS OF MAKING DIPHENYLGUANIDINE. In a process of making diphenylguanidine containing as a reaction impurity carbodi-phenylimide, the steps which comprise dissolving the same in hot toluol, cooling, washing the crystals thus formed with pure toluol, and then drying.—Morris L. Weiss, Brooklyn, N. Y., assignor to Dovan Chemical Co., Wilmington, Delaware. United States patent No. 1,422,506.

MANUFACTURING INSULATING AND RESISTANT ARTICLES. Vegetable fibers are treated with dilute alkali solution in the presence of a vulcanizable oil and rubber at a temperature which does not destroy the structure of the fiber, adding a vulcanizing agent and heating, precipitating the oil within the fiber and vulcanizing the material.—Frank T. Lahey, Akron, Ohio. United States patent No. 1,422,720.

SPONGE RUBBER. A process for the manufacture of spongy rubber material comprises mixing together parts by weight of the following materials: Pará rubber, 15; reclaimed rubber, 15; sulphur, 13; zinc white, 9; carbonate of magnesia, 1½; then adding volatile mineral oil to soften the rubber ingredient, and vulcanizing the mixture.—Anders J. Ostberg and Albert Kenny, Richmond, assignors to The Standard Rubber Works Proprietary, Ltd., Melbourne, both in Australia. United States patent No. 1,422,884.

The Dominion of Canada

ROOFING MATERIAL. A sheet roofing comprising cotton, wool, linen, silk, oil, coal tar products, asbestos, wood pulp, rubber, asphalt, and metal wire.—Rogers E. Moist, Springfield, Missouri. U. S. A. Canadian patent No. 220,378.

MANUFACTURE OF FURFURAL. The cellulose ingredient is treated with dilute acids and submitted to boiling for distillation to eliminate the furfural as soon as it is formed.—La Société Ricard Allenet & Cie., assignee of Eloi Ricard, both of Melle, Deux Severs, France. Canadian patent No. 220,474.

VULCANIZING RUBBER. A method of accelerating the vulcanization of rubber consisting in combining with the rubber a vulcanizing agent and an alkali hydroxide in a solvent.—The Canadian Consolidated Rubber Co., Ltd., Montreal, Inc., assignee of E. E. A. G. Meyer, Detroit, Michigan, U. S. A. Canadian patent No. 220,536.

RETREADING TIRES. The process consists in desulphurizing the tires by heat; applying a cement of rubber, carbon tetrachloride, and sulphur; applying the tread and vulcanizing it.—Emil Nestler, New York, New York, U. S. A. Canadian patent No. 220,971.

The United Kingdom

PHENOL-FORMALDEHYDE CONDENSATION PRODUCT in the form of a viscous liquid which does not adhere to metals is mixed with filler such as asbestos, wood flour, or china clay to give a plastic mass which can be pressed in molds and converted into hard infusible products by heating.—W. Petersen, 6 Lloyd's avenue, London, and E. V. Clark, 56 St. Anne's Crescent, Lewes, Sussex, British patent No. 179,586.

TREATING LEATHER. Leather is impregnated with rubber solution after removal of grease. The rubber is dissolved to suitable consistency in solvent naphtha or benzol. After one or more immersions, the leather is drummed in one or more other rubber solutions of increasing density. During the final drumming there are added at intervals solutions containing gutta percha, balata, gum mastic and gum dammar and finally chloride of sulphur solution.—A. McLennan, Ross, Herefordshire. British patent No. 179,969.

VARNISH FOR COATED FABRIC. Imitation leather is made by embedding the nap of a pile fabric in a coating of flexible material such as pyroxylin or other cellulose ester mixed with a vegetable oil such as blown castor oil, or a coating of a rubber compound. The coating liquid may consist of pyroxylin, solvent, and a semi-drying vegetable oil, with or without a pigment.—E. C. R. Marks, 57 Lincoln's Inn Fields, London; Duratex Co., 768 Frelinghuysen avenue, Newark, New Jersey, U. S. A. British patent No. 180,705.

PUNCTURE CLOSING COMPOSITION. Crumblike shreds of spongy rubber or a rubber substitute prepared from oxidized or vulcanized oil mixed with a thin paste of colloidal clay and water.—W. M. Brothers, Ruddington, Nottinghamshire. British patent No. 180,807.

PACKING. A joint-making packing of the type in which a strip of treated fiber is spirally wound in ring form so that in use the pressure comes upon the edges of the fabric. The material, coated or impregnated with a non-vulcanizable composition of rubber and inert mineral substance, is wound under tension or pressure and cut into rings.—H. Connolly, and B. L. Connolly, St. Stephen street, Salford, Lancashire. British patent No. 180,822.

VULCANIZING INDIA RUBBER. The reaction product of an aldehyde and an amine having an electrolytic dissociation constant greater than 1×10^{-10} is employed as an accelerator. A large number of such products is specified of which the condensation product of heptaldehyde and aniline, produced by heating equal amounts of the two substances with 5 per cent sulphur to 140 degrees C. until the water is evaporated is typical. In the rubber mixing the quantity of accelerator may vary between 0.2 and 0.5 parts. Sulphur may be combined with the accelerator before mixing with the rubber, by heating equal weights of sulphur and accelerator at 140 degrees C. for two hours or more, hydrogen sulphide being evolved.

By use of these substances, over and prevulcanization are avoided and a product of high tensile strength is obtained.—Naugatuck Chemical Co., Naugatuck, Connecticut, assignee of S. M. Cadwell, Leonia, New Jersey, both in U. S. A. British patent No. 180,978 (not yet accepted).

Germany

Patents Issued, with Dates of Issue

PROCESS OF RECOVERY OF BENZENE VAPOR FROM AIR. The benzene-air mixture, containing a large excess of air, is passed through a condenser or similar device maintained at a low temperature, the walls of the condenser having been previously coated with solid benzene. The process is applicable to the recovery of benzene from air containing from 4 to 12 per cent of the vapor, such as is produced in the evaporation of rubber solutions.—E. Goltstein. German patent No. 348,287, June 23, 1920.

LIQUID AGENTS FOR EXTRACTION AND IMPREGNATION PURPOSES AND FOR ADDITION TO RUBBER. Solvents, impregnating agents and rubber compounding ingredients which are acidic or tend to develop acidity, that is, chlorinated hydrocarbons and wood tar, are treated with organic bases such as pyridine, aniline, or quinoline. The products have no corrosive action on metals, while rubber goods, manufactured with a solvent treated in this way, vulcanize more rapidly.—Deutsche Peerless-Gesellschaft. German patent No. 349,699, November 25, 1919.

- 357,707 (July 20, 1920). Method for making plastic masses, threads, films, and the like. Dr. Leon Lilienfeld, Vienna; represented by F. Schwenkerley, Berlin, S. W. 11.
- 358,541 (December 21, 1920). Method for making plastic masses. Wilhelm Schütz, Schloss Strasse 19, and Werner Siebel, Lindenstrasse 255, Düsseldorf.
- 358,727 (November 5, 1919). Method and apparatus for making elastic bodies. Demetrio Maggiora, Florence, Italy; represented by C. Fehlert, G. Loubier, F. Harmsen and E. Meissner, Berlin, S. W. 61.
- 358,728 (November 28, 1920). Method for making articles of hornlike substance. Soc. An. Aclastite, Vercelli, Italy; represented by M. Wagner and Dr. G. Breitung, Berlin, S. W. 11.
- 358,729 (January 29, 1920). Method for converting natural or artificial rubber into other kinds of rubber or into gutta-percha-like substances. Siemens & Halske Akt.-Ges., Siemensstadt near Berlin.

Pigment Microscopy¹

The work accomplished at Palmerton in microscopy has been very elementary so far; however, it has attracted some attention. Our methods for measuring particle size of fine pigments, such as zinc oxide, lithopone, etc., and for microsectioning tires, have been adopted by a number of rubber companies with success.

Most technical laboratories own at least one microscope, but comparatively few can see the necessity of employing a microscopist. It seems to be taken for granted that a chemist will answer the purpose quite well. Even if this chemist should by any chance possess a general knowledge of microscopy, he would find himself quite lost in the field of pigment microscopy, which is in itself a science of fair size and an exceedingly treacherous one for the untrained amateur.

Perhaps it is on account of this fact that such a vast amount of misinformation is prevalent in regard to the relative sizes of paint and rubber pigments. Technologists seem to consider pigments either as coarse or impalpable, and when placed in the last category, the limit of the imagination has been reached. Practically all paint and rubber pigments are thought to be of such exceeding fineness of grain that even the microscope is unable to show the size and shape of the ultimate particle. This statement has been emphatically made by one well-known authority in regard to basic carbonate of white lead, even though it happens that this pigment is an easy one to resolve into individual particles with the microscope.

There are two pigments, however, which are so fine grained that it is practically necessary to photograph them with quartz lenses, using ultra-violet light of approximately .275-wave length. These materials are gas black and a superfine zinc oxide made especially for compounding with rubber, and both are close to 1/10-micron in average diameter. This is considerably smaller than the diameter of the particles of tobacco smoke, which are claimed by Wells to be only .27-micron.

Our method of sectioning rubber tires for microscopical examination is, briefly, as follows: A small piece of tire of suitable size is first hardened in a solution of sulphur chloride in carbon tetrachloride, after which it is mounted in paraffine and sectioned with a microtome. In order to see the pigment particles in rubber compounded with gas black, the sections should be not over one micron in thickness.

In conclusion, I should like to make it plain that it is my belief that as a research instrument the microscope has not been fully appreciated, so far, by either the paint or rubber industries. This conclusion has been forced upon us at Palmerton, not simply after a survey of the literature, but through more or less personal contact with these industries and their technical staffs. An organization like the Technical Photographic and Microscopical Society has an opportunity to introduce to these industries microscopy as a science, and not a plaything to be dabbled in by inexperienced investigators.

¹ Abstract of address by Henry Green, Microscopist, Research Division, The New Jersey Zinc Co., Palmerton, Pennsylvania, at the meeting of the Technical Photographic and Microscopical Society, Hotel Astor, New York, June 14, 1922.

Recent Articles Relating to Rubber

Rubber¹

By Henry C. Pearson, Editor of The India Rubber World

IN this article the Editor of THE INDIA RUBBER WORLD reviews concisely the conditions encountered by the American rubber manufacturing industry in 1921, the outstanding feature being economy. This has been shown in a lessening of factory construction, consolidation of departments, reduction of salaries, cutting out less profitable lines and winnowing out the least valuable help.

The feature of the tire business is the steady call for cord rather than fabric tires. The production of pneumatic tires depends upon two factors: the building of new cars, and tire replacements on cars in use. The production for 1920 was 32,400,000, and for 1921, 25,000,000. For 1922 the estimate is 30,000,000. The increase in the use of motor trucks and passenger omnibuses will mean a vast increase in the production of tires, both solid and pneumatic.

The footwear section is in an exceptionally strong position due to the interest in the finer qualities of cloth-topped rubber soled shoes.

Increase of business is also noted in rubber soles which are regaining popularity for ordinary leather footwear and sport shoes. The hard rubber trade has experienced marked increase in activity attributable to the popular demand for radio apparatus.

¹The Times, London, July 4, 1922.

Aging of Vulcanized Rubber¹

By G. Bruni

Strips of vulcanized rubber enclosed in sealed glass bulbs containing oxygen and maintained at 77 degrees C. for ten days gave a positive pyrrole test indicative of the formation of levulinic aldehyde. "Artificial aging," therefore, gives rise to the same products as the natural process at the ordinary temperature, but in Geer and Evans' method for the former the current of air removes the levulinic aldehyde as it is formed.

¹The India-Rubber Journal, 1922, 63, 814.

Use of Sodium Bisulphite in Sheet Rubber¹

By H. P. Stevens

Latex treated with a small quantity of sodium bisulphite yields sheet rubber with an attractive glossy appearance; otherwise bisulphite is unnecessary and the resulting sheet rubber may dry exceptionally slowly. With the addition of 0.1 per cent and 0.2 per cent of sodium bisulphite to latex, the resulting sheets needed smoking for 18 days; the rate of vulcanization was somewhat reduced, but the tensile strength of the vulcanized product was satisfactory.

¹The Bulletin of the Rubber Growers' Association, 1922, 4, 228-229.

Suggestions for Improvement in Electric Wiring for Automobiles¹

By William S. Haggott²

Automobile wiring is comprised in three main divisions, (1) high tension ignition, (2) lighting including low tension ignition, and (3) starting.

In high tension ignition present practice is about evenly divided between the use of plain rubber covered and braided rubber covered high tension cable. Braided cable, properly constructed,

¹Paper presented before the S. A. E., Buffalo meeting.

²Cable sales manager, Packard Electric Co.

affords protection from oil, heat and ozone. The latter is the worst as it causes the rubber to crack.

In lighting and low tension ignition there is a strong tendency toward the use of armored cable, particularly where wires are exposed and subject to chafing. Rubber covered and braided or varnished cambric and braided cable protected by flexible metallic conduit is sometimes preferred.

STARTING. The general practice is to use rubber covered and braided cable. The gage size is important in order that proper starting torque may be delivered by the starting motor in cold weather.

Note on the Comparative Accelerating Effect of Dimethyl-Dithio-Carbamate of Dimethylamine and of Diethyl-Dithio-Carbamate of Diethylamine¹

By P. Schidrowitz, J. M. S. de Gouvea, and F. G. Osborne

In this investigation the following mixes were used: (1) rubber 200, sulphur 16; (2) rubber 200, sulphur 16, accelerator, 0.5; (3) rubber 200, sulphur 16, accelerator 0, zinc oxide 20; (4) rubber 200, sulphur 16, accelerator 0.5, zinc oxide 20. All cures, except a few, were made at 286 degrees F. in the press after 24 hours rest period and tested 24 hours after vulcanization.

Both the diethyl and dimethyl compounds possess a distinctly accelerating effect in the absence of zinc oxide. So far as comparison is possible there is little to choose between the diethyl and dimethyl compounds in the absence of zinc oxide.

So far as direct comparison is practicable, one to two-minute cures with the dimethyl and diethyl compounds correspond roughly to 265-minute cure of the unaccelerated rubber, sulphur and zinc oxide mixing, and to 320-minute cure of the corresponding rubber and sulphur mixing. The dimethyl compound in the presence of zinc oxide is distinctly more active than the diethyl compound. The "iodized" dimethyl compound is markedly less active than either of the others.

¹The India-Rubber Journal, July 8, 1922, 21-23.

Determination of Available Sulphur in Golden Antimony¹

By D. F. Twiss

In the communication on this subject by Luff and Porritt², it is shown that the customary method for determining the proportion of free sulphur in golden sulphide of antimony intended for use as a compounding ingredient for rubber, can give rise to misleading results; not only may antimony pentasulphide liberate part of its combined sulphur under the ordinary conditions of vulcanization, but also free sulphur may be present in the insoluble S_m form, and this, as I have shown earlier, is capable of effecting satisfactory vulcanization³.

I had already drawn attention to the above defect in the customary procedure for the analysis of golden sulphide of antimony⁴ and by a coincidence there suggested the use of the same term, namely, "available sulphur," as adopted by the authors of the above paper to distinguish between "free sulphur" as estimated in the customary manner and the sulphur capable of participating in the vulcanization of rubber.

¹Journal of the Society of Chemical Industry, January 31, 1922.

²The Journal of the Society of Chemical Industry, 1921, 40, 275t, and THE INDIA RUBBER WORLD, February 1, 1921, p. 356.

³Annual Reports of Progress of Applied Chemistry, 1919, 4, p. 327, and D. F. Twiss and F. Thomas, The Journal of the Society of Chemical Industry, 1921, 48t.

⁴The India-Rubber Journal, 1920, 60, 1914.

The Editor's Book Table

"THE ENCYCLOPEDIA BRITANNICA." The Three New Volumes, together with the Twenty-Nine Volumes of the Eleventh Edition, constitute the Twelfth Edition—a new and distinctive library of reference dealing with events and developments of the period 1910 to 1921, inclusive. The Encyclopædia Britannica Co., Ltd., London, England.

During the past 150 years this encyclopædia has been issued in eleven editions, but its latest edition, the 12th, is not only its best, but is the outstanding achievement of English and American publishers for a generation. Each of the 600 contributors to the new volumes is an acknowledged expert in his own field and therefore can impart first-hand information regarding the discovery of new knowledge covering the period from 1910 to 1921, inclusive. This work is equivalent to over 40 ordinary volumes, with over 5,250,000 words, compressed into three books, printed on India paper and the whole admirably indexed. The work is dedicated to King George V of England and President Warren G. Harding of the United States.

In his preface, the distinguished Editor-in-Chief, Hugh Chisholm, M. A., who also edited the 10th and 11th Editions, says that in the building of the 12th it was his good fortune as architect to be aided by "an international company of practical builders, supplying the world's best available materials and masonry; and he has been inspired by the ambition of cementing and adorning, in the completed edifice, that great movement for Anglo-American coöperation, on whose progress from strength to strength the recovery of civilization after the World War of 1914-1919 must so largely depend."

To be invited to contribute to the Encyclopædia Britannica is a real compliment and rarely is such an honor declined. In complying with the request to supply the article on Rubber, our Editor, Henry C. Pearson, accepted the invitation, not only as a mark of personal appreciation but as a compliment to this publication, the leadership of which in recording the rubber activities of the world has long been conceded. Even more striking is the acknowledgement which such invitation implies of the primacy of the United States in this great key industry.

The article on Rubber emphasizes the important part played by chemistry in the progress of the industry and stresses the valuable work done by physicists and engineers—notably in automotive lines—in helping to improve rubber products. The numerous and curious attempts to improve upon or radically change the Good-year basic process of vulcanizing with sulphur are recorded, and it is also shown that the latter continues, with some modifications, to remain in world-wide favor because it is the simplest and cheapest. Other matters dealt with are: The recent invention of a two-gas cold curing process of much promise in certain lines; the rise and the decline of wild rubber and the great expansion of its cultivated counterpart; course of the market for crude materials; substitutes and synthetic rubber; rubber in the great war; phenomenal growth of the tire industry; the wide variety of rubber products; mechanical aids in rubber making; total production of raw and finished goods in various countries each year; solving of trade problems; outlook for rubber, etc., etc.

It will be recalled that in the 11th Edition of the Encyclopædia Britannica, Volume XXIII, is a very complete article on Rubber by Professor R. Dunstan, M. A., LL. D., F. R. S., F. C. S., covering the subject up to 1910.

The article on Tires by a well known American engineer, James E. Hale, S. B., M. S. A. E., covers both solid and pneumatic tires. It begins with the history of the pneumatic tire in 1910 and brings it up to the present, describing the development of clincher and straight-side tires and their respective values. Fabric and cord construction are also covered in detail, and the growth of the industry is tabulated from 1913 up to 1920. Under Structure, materials, and manufacturing both solid and pneumatic tires are considered and the details of manufacture outlined. Tire troubles are analyzed and properly classified and S. A. E. Standards for inflation pressures for ordinary sizes given. The article is well illustrated by outline cuts.

"THE AGRICULTURAL AND FOREST PRODUCTS OF BRITISH WEST AFRICA." By Gerald C. Dudgeon, C. B. E. Second Edition. Imperial Institute Series of Handbooks to the Commercial Resources of the Tropics. Published by John Murray, Albemarle street, W., London, England. Cloth, 6 by 9 inches.

This volume, which serves as an introduction to the series, and which contains prefaces by Wyndham R. Dunstan, Director of the Imperial Institute, supplies in an interesting form much valuable information regarding a comparatively little known country. Divided into five parts, each section treats of various products, and their cultivation, as exemplified by The Gambia; Sierra Leone; The Gold Coast, Ashanti, and the Northern Territories; and the Northern and Southern Provinces of Nigeria.

Rubber production occupies in this volume a place of importance, and various rubber trees and vines are mentioned as indigenous to the country. In the introduction Mr. Dunstan states: "The only rubber tree which has survived as a producer in the years of strenuous competition is *Hevea brasiliensis*, from which Pará rubber is obtained. Successful plantations of this tree have been established both in the Southern Provinces of Nigeria and in the Gold Coast, and from the former commercial rubber is now being produced of quality equal to that of the rubber plantations of the East." The volume contains many illustrations, and several excellent maps.

"REPORT OF COMMITTEE D-13 ON TEXTILE MATERIALS." American Society for Testing Materials, 1315 Spruce street, Philadelphia, Pennsylvania. Paper, illustrated, 11 pages, 6 by 9 inches.

An account of the researches made by the committee, with recommendations submitted at the 25th annual meeting at Atlantic City, New Jersey, June 26-30, 1922.

While regret is expressed that many textile manufacturers do not appreciate the advantages in making tests common to the seller and buyer, and that there is lack of test standardization on the part of manufacturers, the committee nevertheless notes an improving tendency in this respect. Satisfaction is expressed in the increasing number of manufacturers of square-woven fabric who employ the methods advised by the committee for determining crimp and off-square in standardizing the 60-inch 17¼-ounce fabric. During the past year the committee has been striving hard to better acquaint textile manufacturers with the society's standards, and has urged upon the executive committee of the society the indorsement of the "Standard General Methods for Testing Cotton Fabrics (D 39-20 T)" by the various textile associations.

Since the presentation in 1921 of "Tentative Specifications for Imperfections and Tolerances for 60-inch 17¼-ounce Square-Woven Tire Builder Fabric (D 122-21 T)," much constructive criticism has been received, the result being the committee's unanimous agreement upon a revised form, applying particularly to fabric made of yarn not less than 8-ply.

To fill the need for the development of standards relating to hose and belt ducks a new sub-committee has been appointed, which includes representatives of several of the largest manufacturers and consumers of those fabrics.

One new and important standard is submitted by the committee under "Tentative Methods of Testing Cotton Fibers," and criticisms of the methods, which are welcome, may be sent to G. W. Skirm, secretary of the committee, United & Globe Rubber Co., Trenton, New Jersey.

To the maker and user of the various fabrics used in the rubber industry the report is of exceptional significance. Particularly is it valuable for the exact definitions of the terms employed in the textile industry. "Crimp" and "take-up," for instance, are used interchangeably by many manufacturers, but the committee shows the terms are not synonymous, and should not be confused. Excellent features, too, are the classification and description of imperfections, and the sub-dividing of major, minor, and special defects; the scoring system of grading textiles according to defects; and the determination of tolerances in fabric tests.

New Trade Publications

AN ILLUSTRATED AND RECENTLY ISSUED CIRCULAR SETS FORTH THE uses and special characteristics of "Radion," a particular kind of hard rubber manufactured by The American Hard Rubber Co., 11 Mercer street, New York, N. Y. This well-known organization, which has served the industry for more than seventy years, claims that "Radion" surpasses all other materials in electrical insulating properties; that it has been developed exclusively for radio use; and that it was found, in tests conducted by the New York Electrical Testing Laboratories, to be superior in certain particulars to twelve other standard materials. "Radion" panels, which this company also produces, are said to closely resemble highly polished mahogany.

THE WESTINGHOUSE ELECTRIC & MANUFACTURING CO., EAST Pittsburgh, Pennsylvania, is distributing publication No. 4249-A, describing its line of insulating and soldering compounds. Some of the materials treated in the publication are baking varnishes, air-drying varnishes, insulating compounds, finishing materials, insulating glue, soldering flux, and lubricating oil.

AN ILLUSTRATED BULLETIN, CONTAINING NEWS OF INTEREST TO the automotive industry, is being issued twice a month by the Firestone Tire & Rubber Co., Akron, Ohio. Such a publication, with its various timely items, should prove a success.

AN ILLUSTRATED BULLETIN RECENTLY ISSUED GIVES PRICES AND various specifications regarding steam traps, one of the chief products of the Yarnall-Waring Co., Chestnut Hill, Philadelphia, Pennsylvania. Other manufactures of interest to rubber engineers include several kinds of valves, meters, etc., while power plant devices represent one of the company's specialties.

A NEW CATALOG, FOR JULY-AUGUST, 1922, IS BEING ISSUED BY the wholesale tire and accessories firm known as The Better Tires Co., from its new location at Michigan avenue and 18th street, Chicago, Illinois. In this publication are listed, for the convenience of the dealer, final reduced prices, effective July 5, 1922, on many tires, tubes, and accessories.

A VERY COMPLETE LIST OF CHEMICALS AND REAGENTS APPEARS IN the May catalog of the Central Scientific Co., 460 East Ohio street, Chicago, Illinois. In this publication particular attention is called to "Cenco" certified chemicals, one of this company's important lines, analyzed in its own laboratories and adapted especially for accurate analytical work.

THE EIGHTH ANNUAL REPORT OF THE INTERNATIONAL ASSOCIATION for Rubber Cultivation in the Netherlands Indies, for 1921, contains much interesting information, including statistics concerning the production of rubber in that division of Malaysia. The total planted rubber area in the Netherlands Indies at the end of 1920 amounted to 872,770 acres, of which 526,122 acres were producing, divided as follows: Java, with 378,730 acres, contained 228,105 acres in production, while of the outer possessions, including 494,040 acres, 298,017 acres were producing. The amount of plantation rubber grown and exported during the year 1920 totaled respectively 198,638 pounds and 149,164.4 pounds. It is of importance that Japanese capital is beginning to show more interest in rubber cultivation, Japanese rubber estates in the Netherlands Indies totaling, in 1920, 78,000 acres, of which 1,600 acres were in production.

RUBBER-EATING INSECTS

The *Straits Times* states that the cover of electric wiring in St. Peter's Church, Singapore, was recently discovered to have been attacked by some insect. The cotton covering of the rubber insulations was perforated at short intervals by small holes and practically the whole of the rubber had been removed. If a rubber-eating bug has appeared, the danger to rubber plantations is obvious. The bug may take to drinking latex.

The Inventor of Rubber Glass

Fordyce Jones, chairman of the Reliance Rubber Co., Limited, London, England, and British selling agent for The Faultless Rubber Co., Ashland, Ohio, is a native Englishman who has devoted his entire business life to the rubber industry, traveling extensively and familiarizing himself with its many branches.

Born in London in 1884, and educated in the City of London School, Watson's and Stewart's colleges, Edinburgh, Scotland, he first engaged in the wholesale rubber business in London in 1900, working as warehouse packer, clerk, salesman, sales manager and managing director. He founded a chain of retail rubber stores, the first at Croyden, Surrey, and later gained valuable manufacturing experience from operative to director with western American rubber companies. After a period on Malay States plantations, he became a director of the company of which he is now chairman.



Fordyce Jones

Although at present engaged in the selling branch of the rubber goods industry, he continues to be much interested in technical rubber matters and has his own private experimental laboratory. During the World War he was retained for technical rubber service and since that time has become the inventor of "rubber glass," a new product of much interest and many possibilities. An article describing it appeared in *THE INDIA RUBBER WORLD* of May 1, 1922, and further reference to it is contained in a letter reprinted on another page of this issue.

Mr. Jones is organizing a company to be known as Rubber Glass, Limited, which will manufacture druggists' and surgical transparent rubber sundries by his patent method, which employs the gel molding process, Peachey cure. He is also experimenting with a fluid vulcanized rubber solution which promises to have many advantages.

Mr. Jones is well known in British rubber circles, being a member of the council of the Institution of Rubber Industry, the propaganda committee of the Rubber Growers' Association, American Chamber of Commerce in London, Engineers' Club and various Masonic bodies.

RECORD PRODUCTION OF MOTOR VEHICLES

The steady development of the automotive industry in the United States is indicated by statistics recently prepared by Alfred Reeves, general manager of the National Automobile Chamber of Commerce, showing that in June the motor industry produced in excess of 288,000 motor vehicles, which is 12 per cent greater than the previous figures of 256,000 in May. During the second quarter of 1922 the entire industry produced 763,000 motor vehicles, the total being 1,137,000 cars and trucks for the full six months. The probable production for 1922, according to these figures, will be more than 2,000,000 motor vehicles.

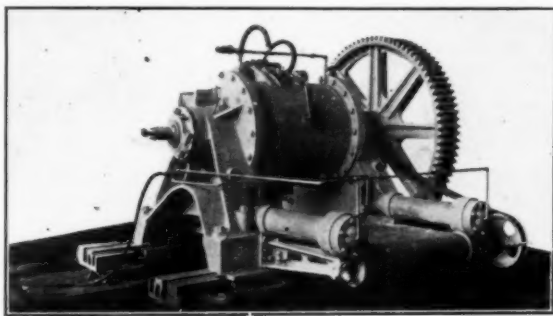
In addition to this our exports along these lines are also growing rapidly, the May figures for this year being three times larger than for May, 1921. These cars and trucks were shipped to 60 or 70 different countries, their purchase indicating revival of interest in motor transportation in those sections.

New Machines and Appliances

Internal Rubber Masticator

WITHIN the last few years rubber manufacturers have given much consideration to the internal mixing of rubber compounds. The illustration shows an internal mixer designed by engineers familiar with the wide range of stock milling requirements of rubber manufacturers. For volume mixing the large type of masticator will handle larger masses in less time than at present can be handled on a 60-inch mill. The output of work which can be done by the masticator and by a mill depends upon the nature and specific gravity of the compound handled.

On this machine crêpe or sliced slabs are broken down and compounds are incorporated at the same time. It is extremely simple, having a single revolving member or rotor within a shell. The rotor carries heavy spiral blades which push the batch back and forth through the restricted center of the cylinder, and knead



Farrel Masticator and Mixer

the mixture against the cylinder walls. The masticating and mixing actions are thus continuous, whereas on a mill they are performed at one point only—the contact of the rolls.

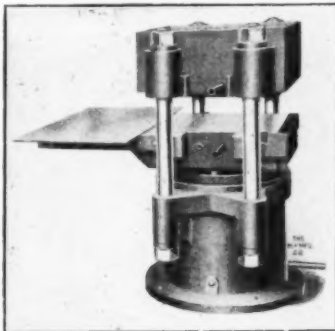
The masticator is rigidly designed with comparatively few parts. The feeding and discharging can be arranged with little disturbance to present shop conditions. Where it is practical to employ the masticator, a considerably larger volume of work can be turned out with greater speed and at a lower operating cost.—Farrel Foundry & Machine Co., Ansonia, Connecticut.

Hard Plastic Molding Press

Plastic molding of phenolic resins requires very heavy pressures. For this work sturdy presses are designed, one type of

which is illustrated here. This is a special single-opening hot press with jacketed head and platen, and operating table or shelf attached.

The press is used for forming small electrical insulating parts from the various dielectric compositions for radio and other apparatus. The molding operation requires the application of heat and pressure to conform the material to the die.



Hot and Cold Plate Press

The platens may be heated by circulation of steam, by gas flames, or by electrical resistance units. The cooling of the

molded material while still in the die under pressure is accomplished by chilling the plates by water circulation.

This is a heavily constructed press and but one of several forms used for plastic mold work.—The Hydraulic Press Manufacturing Co., Mount Gilead, Ohio.

Hand Tachometer

Rubber manufacturers will find the speed gage illustrated here a valuable aid in increasing production. The instrument is very

compact, fits the hand, and weighs but 13 ounces. It is furnished in two standard speed ranges, 20 to 8,000 and 40 to 16,000, each with five intermediate ranges giving approximately 20 inches of effective scale length covering every speed met with in practice.

The dial is graduated individually by hand from a master tachometer and the lines engraved on a 3-inch ivory finished dial. A patented system provides three months' supply of lubricant fed through felt wicks as filters. The oil reservoir and case are dust proof, protecting the works from wear and deterioration.—Schaeffer & Budenberg Manufacturing Co., Brooklyn, New York.



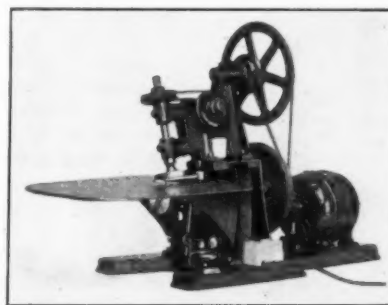
Columbia Speed Gage

Water Bottle and Fountain Syringe Trimming Machine

Molded articles of rubber are greatly improved in appearance and salability by being neatly trimmed. Requisite accuracy in

trimming is possible only by the use of a machine adapted to the class of goods being handled.

The motor-driven machine here shown for trimming water bottles and fountain syringe bags embodies the cutting principle of a pair of shears in which the blades



The Morris Trimmer

are circular to secure continuity of the cutting operation.

At the left of the machine a table is extended which is adjustable for height as if hinged. Upper and lower adjustable guards are provided which cover the edges of the cutters and protect the bags. A space between the guards allows the entrance of the overflow.

In operation the bag or bottle is laid on the cutting table which is raised or lowered to bring the overflow line of the bag level with the point of contact of the cutters. The bags are then moved over the table similar to cloth passing through a sewing machine. The machine removes ninety per cent of the overflow.—T. W. Morris, 3304 Warren avenue, Chicago, Illinois.

"Automatic" Tire Core and Chuck

A most recent development is the "Automatic" core and chuck that will supersede all former De Mattia types in building tires on airbags. The removal of the tire directly on the machine when built is accomplished with a minimum of time and exertion. But a few seconds are required for the operation which is accomplished by the hand-wheel shown in the illustration.

It may be done, however, by air or power attachments. In the former case the removal is effected by a lever which admits air to a cylinder attached to the tire building machine. This lever is reversed for reassembling the core. The same results may be accomplished by mechanical power.



De Mattia Core and Chuck

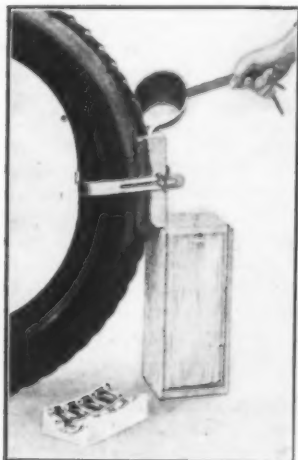
Only one chuck is required for each building machine and any core sections within the range of automobile tire sizes can be quickly fitted and easily removed from the chuck.—De Mattia Bros., Garfield, New Jersey.

Matrix for Tread Repair

"Metazoid" is a patented metal alloy which liquefies at a very low temperature and cools and sets almost immediately. The

mold is attached to a sound part of the tire to be repaired and is packed with putty, an opening being left at the top. A small quantity of metazoid is melted and poured into the mold which can then be used for reproducing the non-skid pattern on the tread repair. The low temperature at which the material becomes fluid prevents the rubber being injured, provided it is not heated beyond the melting point.

Metazoid can be obtained in nuggets, or as part of a special outfit, and can also be used for repairing the sides of straightside tires.—Harvey Frost & Co., Limited, 148-150 Great Portland street, London, W. 1, England.



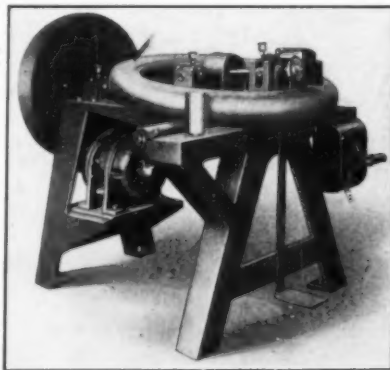
Metal Negative Pad

Harvey Frost & Co., Limited, 148-150 Great Portland street, London, W. 1, England.

Tire Bead Cutter

The illustration shows a motor-driven machine of great value to reclaimers and dealers in scrap rubber tire stock for the inexpensive and rapid removal of tire beads from old tires. Its construction is simple and substantial.

In operation the tire is placed as shown in the picture and made to revolve horizontally by the driving effect of several adjustable vertical and horizontal rollers. Meantime, pressure on the treadle inserts a circular disk knife which severs the bead from the carcass as the latter revolves.



Thropp Tire Bead Cutter

The machine is under electric control and is capable of removing beads from a heavy tonnage of tires daily.—William R. Thropp Sons' Co., Trenton, New Jersey.



Bliss Kick Press

Such a press is a machinist's common tool, convenient in many ways for the rubber worker.—E. W. Bliss Co., Brooklyn, New York.

Foot-Lever Press

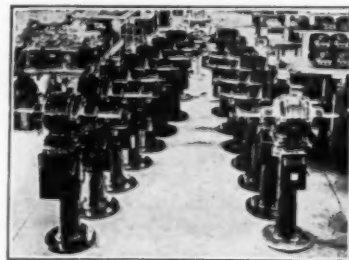
There are many forms of foot-lever or "kick" presses, one of which is shown in the illustration. Other forms are toggle-joint and knuckle-joint foot presses.

A machine of this kind is adapted for light metal stamping, such as sheet aluminum labels for marking rubber goods, or for cutting and trimming vulcanized rubber articles by special cutters or dies.

Rubber Buffer

A very useful tool for tire factory and repair shop is the buffer here pictured which has recently found place in some of the tire

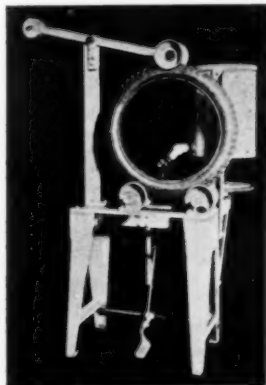
service stations of the Post Office Department. The machine is a ball bearing two horsepower motor with the rotor shaft extended sufficiently on each side to carry an emery wheel and a compound brush. The buffer is mounted on a heavy cast-iron base carefully proportioned for rigidity. The end plates of the motor are enclosed to exclude dust from the windings. The machine stands 46 inches high and occupies four square feet of floor space.—The Valley Electric Co., St. Louis, Missouri.



Valley Tire Buffers

Tire Casing Painting Machine

Tire manufacturers and repairmen will be interested in the machine here shown and used for painting the inside of casings with a preparation to prevent adhesion of the tube.



Utility Tire Painter

The machine is power-driven through a quick acting clutch and the 15-gallon solution tank is provided with an agitator to prevent settling of the coating material. The swiveled feed pipe that delivers the solution to the inside of the casing is of large diameter permitting rapid operation.

The tire is placed on two concave rollers and held upright by an idle roller revolving at the end of an adjustably balanced lever. Depressing the treadle starts the tire revolving by friction of the concave rollers. Release of the treadle stops the machine. The capacity is claimed to be 1,500 tires a day.—Utility Manufacturing Co., Cudahy, Wisconsin.

Airless Truck Tire Core

The airless vulcanizing core for truck tire repairing, as here illustrated, is heated internally by steam coils for all sizes from 6 to 12 inches.

Pressure for consolidating the repair under vulcanization is effected by expansion of the rubber body of the core and is greater than that obtainable by inflation of the airbag of ordinary construction.

The core is claimed to be practically indestructible and a great time saver for the repairman.—First National Tire & Reliner Co., Grand Rapids, Michigan.

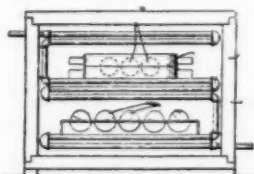


Truck Tire Repair Core

Machinery Patents

Golf Ball Manufacture

In making golf balls an inner core is used, made either of a liquid or mobile substance which is frozen in spherical shape while in a mold.



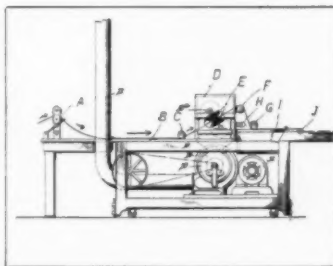
Golf Ball Process

The illustration shows a number of such centers in molds arranged in a refrigerating chamber. The cores are frozen solid at about 40 degrees F. and are then covered with a pair of cup-shaped pieces of rubber which are vulcanized as a casing over the center.

The encased core is frozen again and wound with rubber tape under tension and receives an outer covering of gutta percha or similar material in the usual manner. The full construction of the ball is seen in part section showing covered center, rubber tape winding and outer cover.—The B. F. Goodrich Co., New York, N. Y. British patent No. 180,619.

Machine for Inspecting Rubber Sheet

The machine illustrated in side elevation provides a means for dusting and examining for defects thin transparent rubber in sheet form such as used in making bathing caps, dress shields, etc.



Rubber Inspecting Machine

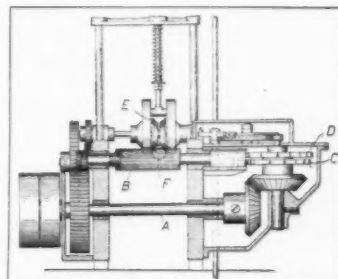
The rubber sheet dusted on both sides comes to the machine on a stock shell, entering between a pair of rollers A. It is drawn over the table B, under the guide roller C, thence it enters the dust box D, passing diagonally upward between the revolving cylindrical brushes E, which removes all loose dust from the rubber sheet.

The cleaned sheet leaves the box over roller F and downward under roller G. Under the sheet at this point is a row of electric lamps H, which reveal any perforation in the sheet. Continuing along the table the sheet passes over a glass plate I under which electric lamps permit a second inspection before the sheet is wound on a shell J.—Otto H. Macklin, assignor to The Miller Rubber Co., both of Akron, Ohio. United States patent No. 1,421,795.

Winding Machine for Soft Center Golf Balls

The machine here shown is so constructed that a ball with a soft center may be wound under tension without distortion of the center or core.

The winding rollers are gear and cam connected with the drive shaft A. The shafts on which the two parallel rollers B are connected carry rollers engaging cams C and D. The cams cause the rollers B to alternately move to the left, the rollers being moved in the opposite direction by springs.



Golf Ball Winder

Above rollers B are mounted two beveled pressing rollers E, rotated at different speeds, that not only hold the ball in contact with the rollers but impart motion to it.

In operation, a turn of tape is wound around core F which is placed on rollers B and under presser rollers E. The core, due to the movements of these rollers, is rotated about a horizontal and a vertical axis from four points, namely: the two points of contact of the rollers B and the two points of contact of the driven pressure rollers E, thereby applying the winding tape to a soft core without distortion.—Evert G. Loomis, Newark, New Jersey. United States patent No. 1,423,807.

Other Machinery Patents

The United States

- 1,421,450 Apparatus and method for manipulating flexible articles. J. R. Gammeter, Akron, O., assignor to The B. F. Goodrich Co., New York, N. Y. (Continuation of application Serial No. 484,328.)
- 1,422,065 Apparatus for vulcanizing tire casings. W. R. Urquhart, Los Angeles, Calif., and C. W. Post, Akron, D. E. Humphrey, Cuyahoga Falls, and C. C. Van Arsdale, Akron, O., assignors to The Goodyear Tire & Rubber Co., Akron, O.

- 1,422,147 Vulcanizing tire casings. E. C. Taylor, Springfield, assignor to The Fisk Rubber Co., Chicopee Falls—both in Mass.
 1,422,209 Apparatus for vulcanizing sectional tire treads of rubber or rubberized fabric. P. J. Knaus, Milwaukee, Wis., assignor by mesne assignments to The Fisk Rubber Co., Chicopee Falls, Mass.
 1,422,537 Manufacture of tire casings. W. B. Burke, Cleveland, O.
 1,422,561 Rubber forcing machine. J. W. Gomersall, Manchester, Eng.
 1,422,822 Machine for applying solutions of rubber or the like to fabric. A. Becker, Malmö, Sweden, assignor to Benzine Condensation Co., Inc., a New York corporation.
 1,423,349 Tire molding machine. R. McClenathan, assignor to Kelly-Springfield Tire Co.—both of Akron, O.
 1,423,761 Mold for pneumatic tubes and similar articles. W. L. Fairchild, New York, N. Y.
 1,423,769 Press. W. Klocke, New York, assignor to E. W. Bliss Co., Brooklyn—both in N. Y.
 1,423,798 Fabric-cutting apparatus. J. F. Hennessy, Akron, O., assignor to The B. F. Goodrich Co., New York, N. Y.
 1,423,838 Apparatus and method for covering balls. I. De Gowing, assignor to The Seamless Rubber Co., Inc.—both of New Haven, Conn.
 1,423,870 Tire making machine. F. C. Morton, New Haven, Conn.
 1,423,929 Apparatus and method for forming tire beads. W. G. Fording, Cleveland, O., assignor to The Fisk Rubber Co., Chicopee Falls, Mass.
 1,423,967 Comb cutting machine. H. Schelhammer, Whitestone Landing, assignor to American Hard Rubber Co., New York—both in N. Y.
 1,423,968 Comb cutting machine. H. Schelhammer, Whitestone Landing, assignor to American Hard Rubber Co., New York—both in N. Y.
 1,424,012 Tire trimming device. F. H. Grove, assignor to The Banner Machine Co.—both of Columbiana, O.
 1,424,133 Bundle conveying and cutting apparatus. N. M. Johnson, assignor to The Goodyear Tire & Rubber Co.—both of Akron, O.

The Dominion of Canada

- 220,719 Rubber bale cutter. The Canadian Consolidated Rubber Co., Ltd., Montreal, Que., assignee of E. Eger, Detroit, Mich., U. S. A.
 221,036 Tube making machine. The Canadian Consolidated Rubber Co., Ltd., Montreal, Que., assignee of H. Cobb, New York City, U. S. A.
 221,144 Manufacture of extensible bead tire having cords tightened by wedges before curing. G. H. Wheatley, Chicago, Ill., U. S. A.
 221,145 Apparatus for making non-extensible bead tires. G. H. Wheatley, Chicago, Ill., U. S. A.
 221,220 Tire removing apparatus. N. L. Caldwell, Knoxville, Tenn., U. S. A.
 221,385 Apparatus and method for vulcanizing the protective cover of a tire. D. F. Wilhelm, Doorwerth, Holland.
 221,410 Machine for applying strips of material to bathing caps, etc. The Canadian Consolidated Rubber Co., Ltd., Montreal, Que., assignee of M. Brodeur, J. T. Broden, and H. E. Bainton, all of Providence, Rhode Island, U. S. A.
 221,412 Apparatus for manipulating vulcanizing devices. The Canadian Consolidated Rubber Co., Ltd., Montreal, Que., assignee of H. R. Gilson, New Rochelle, N. Y., and G. F. Fisher, Roselle, N. J.—both in U. S. A.
 221,518 Apparatus for making hollow rubber articles. Paramount Rubber Consolidated, Inc., Philadelphia, Pa., assignee of F. T. Roberts, Cleveland, O.—both in U. S. A.

The United Kingdom

- 179,571 Tire core. E. C. R. Marks, 57 Lincoln's Inn Fields, London: The Fisk Rubber Co., Chicopee Falls, Mass., U. S. A.
 179,582 Repair vulcanizing press. L. Smith, 44 Upper Marylebone street, and J. T. Barkwith, 37 Barclay Road, Waltham Green—both in London.
 179,615 Tire making machine. Dunlop Rubber Co., Ltd., 1 Albany street, Regent's Park, London, and C. Macbeth, Fort Dunlop, Erdington, Birmingham.
 180,704 Hand guard for rubber mills. L. Gaisman, Spring Bank House, Woolley, Stockport, Cheshire.
 180,727 Collapsible tire core. P. E. Welton, R. F. D. No. 2, Cuyahoga Falls, Ohio, U. S. A.
 180,831 Machine for washing, milling, macerating, and cleaning rubber. H. Berry & Co., Ltd., Croydon Works, Leeds, and P. G. Bradford, Greasborough, Rotherham.

New Zealand

- 47,092 Machine and process for making tire carcass forming material. The Yoder Morris Co., 58th street and Walworth avenue, assignee of H. I. Morris, 5510 Walworth avenue—both in Cleveland, Ohio, U. S. A.

Germany

Patents Issued, with Dates of Issue

- 357,339 (March 17, 1920). Rubber rolls for paper machines. Simon Fuhsack, Kiehlstrasse 188, Berlin-Baumschulenweg.
 357,422 (April 12, 1914). Machine for coating and impregnating strips of cloth, as in the manufacture of balata driving belts. Albert Boecker, Haller Strasse 63, Hamburg.
 357,455 (March 6, 1920). Machine for proofing. Henry Lyon Scott, Providence, R. I., U. S. A.; represented by Dr. R. Geissler, Berlin, S. W. 11.
 357,623 (February 5, 1921). Apparatus for making raised designs on rubber gloves. Zieser & Wiegand, Leipzig-Volkmarisdorf.
 357,886 (March 23, 1920). Machine for attaching in consecutive working order heels made in two parts and having a rubber patch. United Shoe Machinery Corporation, Paterson, N. J., and Boston, Mass.—both in U. S. A.; represented by K. Hallbauer, and A. Bohr, Berlin, S. W. 61.

- 358,472 (July 5, 1921). Mold for making treads and the like. James A. Swinchart, Akron, O., U. S. A.; represented by H. Neubart, Berlin, S. W. 61.
 358,900 (July 30, 1921). Kettle press for vulcanizing rubber. Wenzel Miersch, Westhafen, Frankfurt-on-the-Main.
 358,901 (June 13, 1920). Mechanism for sloping the ends of solid rubber tires. The Dunlop Rubber Co., Limited, London; represented by R. H. Korn, Berlin, S. W. 11.
 358,929 (July 10, 1920). Machine for forming cord tire fabric. The Goodyear Tire and Rubber Co., Akron, Ohio, U. S. A.; represented by J. Apitz and F. Reinhold, Berlin, S. W. 11.

Design Patents Issued, with Dates of Issue

- 817,442 (July 31, 1920). Vulcanizing apparatus for single tires. Wilhelm M. Kloeppel, Bodenstedtstrasse 4, and Anton Marshall, Gutleutstrasse 96, Frankfurt-on-the-Main.
 817,832 (January 3, 1922). Tool for putting treads on cores in machines for making treads or casings for pneumatic tires. The Dunlop Rubber Co., Limited, London; represented by Dr. R. Wirth, C. Weike, Dr. H. Weil and M. M. Wirth, all of Frankfurt-on-the-Main, and T. R. Koehnorn and E. Noll, Berlin, S. W. 11.
 818,277 (May 16, 1922). Lifting fork for lifting off rubber heels. Bruno Lungwitz, Spiegelstrasse 25, Zwickau.

Process Patents

Preparing Rubber by Latex Spraying

The disadvantages of preparing crude rubber from latex by coagulating, washing, drying, smoking and milling are eliminated by this process, which improves the rubber by inclusion of all natural solid constituents of the latex.

The apparatus consists of a chamber through which a current of hot air is blown and baffled in its passage by a number of partitions. Mounted on the chamber is a latex reservoir provided with stirring apparatus for mixing vulcanizing or compounding ingredients with the latex.

The latex enters the chamber below and is sprayed by the air jets, and passes through the current of hot air which absorbs the water content, the caoutchouc and other solid materials being deposited as a fluffy, white, spongy product.

That no portion of the solid constituents may be lost, spiral baffles are arranged at the outlet.—Ernest Hopkinson, New York, N. Y., assignor to General Rubber Co., a New Jersey corporation. United States patents Nos. 1,423,525 and 1,423,526.

Other Process Patents

The United States

- 1,421,616 Making liners for reinforcing covers of pneumatic tires. W. H. A. Theed, South Kensington, and A. T. Phillips, Hammer-smith—both in England.
 1,422,046 Forming tire carcass. W. G. Fording, Cleveland, O., assignor to The Fisk Rubber Co., Chicopee Falls, Mass.
 1,422,451 Manufacture of 2-ply rubberized tire fabric. F. A. Krusemark, assignor to K., F. & C. Tire & Rubber Corporation, both of Roanoke, Va.
 1,422,579 Manufacture of rubber tiling. W. J. Kent, Brooklyn, N. Y., assignor to Peerless Rubber Manufacturing Co., a New York corporation.
 1,422,642 Producing a rubber globe for use as educational toy. E. M. Walters, Hove, Eng.
 1,422,813 Laminated composite wheel. H. N. Atwood and G. B. Bains, 3d, Reading, Pa.
 1,423,525 Treatment of rubber-containing latex. E. Hopkinson, New York, N. Y., assignor to General Rubber Co., a New Jersey corporation.
 1,423,760 Vulcanizing pneumatic tubes. W. L. Fairchild, New York, N. Y.
 1,424,020 Production of fabrications of rubber and filamentary material and products obtained. E. Hopkinson, New York, N. Y.
 1,424,134 Building solid tires. P. W. Litchfield, assignor to The Goodyear Tire & Rubber Co.—both of Akron, O.

The Dominion of Canada

- 220,507 Manufacture of inner tubes. A. E. Henderson, Toronto, Ont.
 221,144 Manufacture of extensible bead tire having cords tightened by wedges before curing. G. H. Wheatley, Chicago, Ill., U. S. A.
 221,408 Producing inert gases. The Canadian Consolidated Rubber Co., Ltd., Montreal, Que., assignee of J. J. Shea, Hartford, Conn., U. S. A.
 221,409 Skim coating both sides of fabric with vulcanized plastic materials. The Canadian Consolidated Rubber Co., Montreal, Que., assignee of G. F. Fisher, Roselle, New Jersey, U. S. A.

The United Kingdom

- 179,622 Dehydrating crude rubber. Sir S. C. Davidson, Sirocco Engineering works, Belfast.
 180,619 Manufacture of golf balls with frozen cores, etc. The B. F. Goodrich Co., New York, N. Y., assignee of J. R. Gammeter, North Portage Path, Akron, O.—both in U. S. A. (Not yet accepted.)

Interesting Letters from Our Readers

Rubber Glass from Vulcanized Precipitate

TO THE EDITOR:

DEAR SIR: I was very much interested in your article on the possibilities of rubber glass and congratulate you on your vision and grasp of the subject.

I can get a clearer material by the precipitation of the cured rubber from vulcanized solution. This gives a plastic though vulcanized mass which can be pressed or molded into shape. Although solvent and precipitant are largely left in liquid form, thus saving solvent recovery difficulties and expense, it leaves a problem of separation which has to be studied before economical production can be promised, but if this process can be resolved to manufacturing conditions, it will be a very revolutionary one in the rubber industry, and one which will have great possibilities.

I think it will be the first time that a perfectly vulcanized plastic mass has been obtained, which, although it contains about 10 per cent of solvent, shows very little shrinkage on drying out, and which, when dried out, produces a glass clear and perfectly vulcanized rubber article.

Although this process can be operated with the hot sulphur cure, Parke's chloride cure or Peachey process, I may say that I have got the best results with the latter process, and, I believe, a more durable rubber. Aging tests have proved very satisfactory.

Another item of interest is that a properly vulcanized rubber solution may be obtained. Dipped goods can be made from this, which are properly cured on drying out. Any aniline or other dye can be used for these processes.

London, England.

FORDYCE JONES.

The Old Ones Are the Best

TO THE EDITOR:

DEAR SIR: I note with considerable amusement the inquiry of "Curious" in the August issue concerning the name of the laboratory implement known as a policeman. Your explanation is logical, but may I submit the one offered for many years to his students by Professor C. W. Foulke, head of the department of analytical chemistry, Ohio State University; namely, the word policeman is used because you can never find it when you want it.

If you include this little comment in your next issue, I would suggest that you use the heading: "The Old Ones Are the Best." This little joke is a perennial that blooms in many forms.

Pittsburgh, Pa.

MELVIN DE GROOTE.

Suggestions from a Well Known British Planter

Splinters in Plantation Rubber

TO THE EDITOR:

DEAR SIR: You will, I feel sure, remember that we went pretty thoroughly into this subject when I was representing the British Malayan planters at the New York Exhibition in 1912.

My attention was directed to the bad packing of plantation rubber and I never rested until I had taken steps which I fondly imagined would lead to the removal of the causes of complaint. It was, therefore, a painful surprise to see in your June issue of THE INDIA RUBBER WORLD that out of nineteen of the largest users of our produce in America a large majority are still troubled by splinters and other foreign substances.

Speaking on October 2, 1912, at the New York International Banquet, I described my experience of inspecting the stocks of

a well known manufacturer within a hundred miles of that city. His rubber was bought as "Highlands Sheet." It may have been grown and prepared on the Highlands and Lowlands Plantation, but having known the property from the time it was virgin jungle and watched the methods all along, I was able to assure the buyer that unplanned packing cases, large enough to contain cottage pianos, were not used on that plantation, and I did not believe that any such could be found on any Malayan plantation for the purpose of packing rubber. To one who remembered the scrupulous care with which every sheet was dried, smoked, folded and packed in Venesta cases, which we were then able to obtain from Russia, the whole idea was pathetically humorous. This particular shipment had been bought from, or through, a London dealer, and I went on to tell my audience that if they found it necessary to repack our rubber in London, we should have to ship direct from the East to New York.

My suggestion appeared to be very welcome to the manufacturers present, but there was less enthusiasm at a table surrounded by London dealers. One of them was good enough to explain to me, afterwards, that the original cases were not strong enough for reshipment. I replied that for that very reason, reshipment proving such a destructive operation, it might be dispensed with and direct shipment from Singapore and Colombo to New York adopted as an alternative.

To show that I had the courage of my opinions, I arranged for a direct deal between Jugra Estate, F. M. S., and New York. Now, according to your figures, more than three-quarters of the rubber imported into U. S. A. travels that way. Well, again we have the old complaint and we must find out what is wrong now. Whether the post-war case—like so many things—is not up to pre-war standard, or whether the handling at our eastern ports is more severe, is a matter for discussion, but growers are frequently charged for the renewal of cases when the rubber is transhipped from the coastal steamer to the ocean carrier at Singapore, and when the rubber is shipped in fulfilment of a contract.

There is some indication that the mischief occurs when the rubber is in the hands of the buyer's agents at Singapore or Colombo. Mr. Salmon gives us a useful hint when he states that rubber *has been* shipped to the Pennsylvania Rubber Co. in Momies and some in veneer cases, but believes that the cost of the latter prohibits most shipments being made in them. As I believe that no reputable estate in Malaya ships rubber in anything else—except possibly a few in another covering which I will refer to later—I should like to know in what sort of case the rubber does arrive.

Producers are charged the cost of the veneer or triple-ply cases when the original is damaged in course of transit to the port of ocean shipment. The triple-ply veneer cannot splinter unless thoroughly smashed, and for this reason, among others, many of us favor them against Momies which may splinter when less severely damaged.

The other covering I referred to above is rubber packing, a specimen of which was shown at the 1921 Exhibition in London. Wood is dispensed with altogether and the rubber packed in a casing of low grade crêpe. If this would meet the views of your manufacturers, we should hear no more about splinters or broken cases, and the packing material ought to be of some value afterwards.

May we have the views of any manufacturers who have received rubber packed in rubber?

It must be remembered that while low grade crêpe is at present worth little more than wood, the day may come when the cost of

packing will be a serious consideration, unless the cover, as well as the contents, arrives in a marketable condition.

It is a matter of great importance to growers that their rubber should be received by the manufacturer in no worse condition than it leaves the plantation, and in view of the very serious charges made by so many of our leading customers, it is essential that we should discover the real culprits, and, if possible, put it out of their power to do more mischief by agreeing between ourselves upon a fool-proof packing.

I trust that The Rubber Association of America will take the matter up with the Rubber Growers' Association of London and the Planters' Association of Malaya and Ceylon, so that the matter may have the fullest possible publicity.

It would also be valuable if definite details of particular shipments could be furnished.

London, England.

C. BAXENDALE.

Judicial Decisions

UNITED SHOE MACHINERY CORPORATION ET AL. VS. UNITED STATES. (Reargued Jan. 17 and 18, 1922. Decided April 17, 1922.)

No. 119. Appeal to Supreme Court from the District Court of the United States for the Eastern District of Missouri.

A suit brought by the United States against the defendants, United Shoe Machinery Co. (of Maine), United Shoe Machinery Corporation, United Shoe Machinery Co. (of New Jersey), and the officers and directors of these corporations, was, after a decree enjoining the insertion of certain specified clauses in the leases, appealed to the Supreme Court. The question concerns violation of Section 3 of the Clayton Act (Comp. St.—8825 c). The final ruling was that while the making of a lease of machinery is not of itself "interstate commerce," Congress has authority to control the making of such leases, where a movement of goods in interstate commerce is required.—*Supreme Court Reporter*, Vol. 42, No. 13.

THE FIRESTONE TIRE & RUBBER CO. ET AL. VS. MARLBORO COTTON MILLS. (District Court, Eastern District of South Carolina. January 12, 1922.) In Equity. Suit to restrain the enforcement of a default judgment. Plaintiffs' motion for temporary injunction and defendant's motion to dismiss the bill were refused.

In the suit, confusion was caused through two companies having practically the same name—The Firestone Tire & Rubber Co., an Ohio corporation established in 1909, and a subsidiary, Firestone Tire & Rubber Co., established in West Virginia in 1900. The court ruled that, under Section 129 of the Judicial Code of the United States, an appeal might be made, and that if such an appeal were made in due time, the appellant might move that such restraining order be continued subject to the determination of such appeal. If no appeal were taken in 30 days from the date of this order the defendant herein might move that such temporary restraining order be discharged.—*Federal Reporter*, Vol. 278, No. 5.

I. T. S. RUBBER CO. VS. UNITED STATES RUBBER CO. (District Court, Northern District of Illinois, Eastern District. February 15, 1922.) No. 1993. In Equity. Suit for infringement of a patent. Defendant's motion to dismiss the bill denied, and decree rendered for plaintiff.

The court, in deciding that the defendant had infringed upon the patent, also ruled that a draft decree could be drawn by the plaintiff's counsel, and served upon the defendant's counsel, who would have 10 days from the date of service upon it to file objections to the form of the decree, in which event a time and place for a hearing upon the form of decree would be fixed.—*Federal Reporter*, Vol. 278, No. 6.

THE B. F. GOODRICH RUBBER CO. VS. MILLERS, INC. (Supreme Court of Rhode Island, March 24, 1922.) No. 5548.

In a case regarding the value of automobile tires sold, the evidence was held insufficient to show a price reduction, entitling defendant to a rebate. Exceptions from Superior Court, Providence and Bristol Counties, held unimportant. No error was

found in the previous rulings of the trial justice. From an order directing verdict for plaintiff, the defendant brought exceptions. All the exceptions were overruled and the case remitted to the superior court, with direction to enter judgment on verdict.—*Atlantic Reporter*, Vol. 116, No. 5.

Appraiser's Decisions

No. 45014. Protest 941470 of Cohn Bros. (St. Louis).

COTTON MANUFACTURES—LENGTH OF STAPLE. Certain cotton cloth is claimed not subject to duty at 7 cents per pound under paragraph 17 of the emergency tariff act in addition to the regular duty under paragraph 252 of the tariff act of 1913, on the ground that it is composed of a staple less than $1\frac{3}{4}$ inches in length.

Opinion by WELLER, G. A. An analysis of a sample showing the cotton to be of a staple less than $1\frac{3}{4}$ inches long, it was held not subject to additional duty under paragraph 17 of the emergency tariff act.—*Treasury Decisions*, Vol. 41, No. 25, June 22, 1922.

No. 45103. Protest 943309 of A. Rosenthal & Son (New York).

CRUDE GUM. Merchandise classified at 15 cents per pound under paragraph 36, tariff act of 1913, is claimed entitled to free entry as crude gum under paragraph 477.

Opinion by McCLELLAND, G. A. Crude caoutchouc gum used in the manufacture of chewing gum was held free of duty under paragraph 477 as claimed. *United States v. Danker* (2 Ct. Cust. Appls. 522; T. D. 32251) noted.—*Treasury Decisions*, Vol. 42, No. 2, July 13, 1922.

No. 45118. Protests 947386, etc., of Fuchs & Lang Manufacturing Co., et al. (New York).

PRINTERS' BLANKETS. Printers' blankets classified as cotton chief value at 30 per cent ad valorem under paragraph 266, tariff act of 1913, are claimed to be in chief value of india rubber, dutiable under paragraph 368 or 369.—*Treasury Decisions*, Vol. 42, No. 2, July 13, 1922.

Opinion by WELLER, G. A. The record not warranting a reversal of the collector's action the protests were overruled.

The Morse Chain Company

Since its organization in 1893 the Morse Chain Co., of Ithaca, New York, has followed a line of steady development in the manufacture of frictionless rocker joint chains and high speed silent running flexible gearing for power transmission. The company began the manufacture of bicycle chains at Trumansburg, New York, in the days when bicycles were popular, following this with the development, in 1899, of a silent chain with rocker joint for power transmission purposes.

The first power chain drives were put out the latter part of 1902 and since that time the business has steadily grown and the evolution of the chain has kept pace with what experience and research suggested. From a plant employing some thirty men and putting out some 12,000 h.p. in drives a year, it has grown to a plant employing seven or eight hundred and making annually the equivalent of some million h.p. in drives.

In 1905 construction was begun on a new factory at Ithaca, New York, where the company commenced operations in the following year. Since that time various developments and enlargements have become necessary with the constant growth of the business. The success of the silent chain drive has been so pronounced that the industries generally are using it successfully in the most varied applications covering the whole range of power transmissions.

The executive personnel of the Morse Chain Co. includes: F. L. Morse, president and treasurer; E. T. Turner, vice-president; D. B. Perry, secretary; and C. L. Saunders, purchasing agent.

READY FOR MAILING. "PNEUMATIC TIRES," BY HENRY C. PEARSON. An encyclopedia of tire manufacture, repair, rebuilding, machinery and processes.

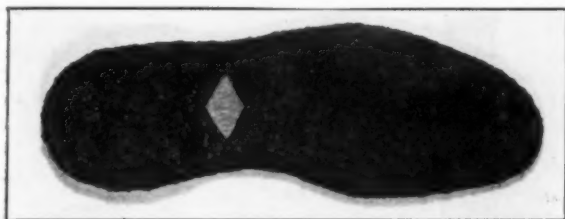
New Goods and Specialties

Crêpe Rubber Sole for Sports Shoes

THE growing popularity of the crêpe rubber sole on sports shoes has led one American manufacturer to trade mark his product "Rajah." The "Rajah" sole is made of unvulcanized, coagulated latex, by a special process.

This sole is built up of three layers of crêpe with two additional layers inserted at the heel, and is used in the natural color of the rubber, a dark cream or beige, no pigments being added. It therefore harmonizes well with the different colors of leather used in popular sports footwear.

While some crêpe soles are stitched in place over the ordinary leather ones, the "Rajah" is attached without sewing. It is claimed that it is extremely durable, does not slip or track dirt, and that



The "Rajah" Crêpe Sole for Sports Shoes

it gives the perfect tread so important on golf greens. It is being successfully applied by high class manufacturers of golf, tennis, yachting, and basket ball shoes.—Alfred Hale Rubber Co., Atlantic, Massachusetts.

A Group of Popular Tires

The "Viking" cord and fabric tires are hand-made, air-cured, and oversize, of excellent quality.—The Combination Rubber Manufacturing Co., Bloomfield, New Jersey.

The "Dayton Airless," built with piers of rubber vulcanized as parts of the tire, has the upper half of more resilient rubber than the lower.—The Dayton Airless Tire Co., Dayton, Ohio.

The "Cross-Rib" is a light weight, one-cure, low price, quality cord tire.—The Goodyear Tire & Rubber Co., Akron, Ohio.

The "Maxi-Mile," a low price,

Convenient Dishwasher Attaches to Faucet

Dealers in household appliances may now add to their lines another time and temper saver in the "3-Minute" dishwasher,

which attaches to the hot water faucet by a hose of rubber specially treated to withstand grease and heat. The aluminum nozzle is fitted with turbine blades to receive the force of the water and revolve the removable soap container. The device both washes and sterilizes without wetting the hands.—Household Appliance Co., Jefferson City, Missouri.



"3-Minute" Dishwasher

Attractive Pencil of Redmanol

The "Realite" mechanical pencil is a redmanol product finished in black, maroon, green, or mottled, with or without clip, with



"Realite" Redmanol Automatic Pencil

tips of silvonite or gold filled, and equipped with full size red rubber eraser and extra leads.—Realite Pencil Co., 370 Seventh avenue, New York.



Combination "Viking"



Dayton "Airless"



Goodyear "Cross-Rib" Cord



Mason "Maxi-Mile" Cord



Firestone "Cross and Square"



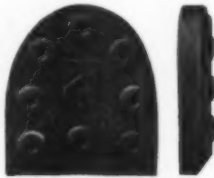
Grow Cord

airbag-cured cord to replace fabrics, has the distinguishing green stripe and non-skid tread of the "Heavy Duty." It is about three

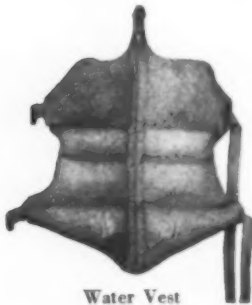
same company also makes oversize machine-made fabric tires.—Grow Tire Co., Boston, Massachusetts.

Wedge Heel Insures Flat Tread

Especially designed to give a perfectly flat tread and balance to men's low-heeled shoes, the "Armortred" wedge heel is graduated in thickness from back to breast, being 5/16-inch thick at the square breast and 7/16-inch thick at the back. It has eight nail-holes to accommodate the standard nailing machine. The "Armortred" heel is made in black, tan and white, in sizes from 11 to 6; also 5 scaled down.—Quabaug Rubber Co., North Brookfield, Mass.



"Armortred" Heel



Water Vest

Water Vest for Safety

Intended for wear over bathing suits, this patented water vest straps in place, or it may be sewed inside the suit. It is inflated or deflated at will and is made in four regular sizes, or special ones. It weighs five ounces and folds into an envelope. — The Swimming Device Co., 124 North Michigan street, South Bend, Indiana.

"Blue Colonel" Balanced Golf Ball

Dealers in sporting goods will welcome what is claimed to be a scientifically-balanced golf ball, possessing special advantages of quality and construction, now being offered under the name "Blue Colonel." It has the dimpled marking and each ball is tested.—St. Mungo Manufacturing Co. of America, 121-123 Sylvan avenue, Newark, New Jersey.

Curtain Lights Set with Rubber Gasket

The "Grip-Tite" curtain light, whatever its shape—oval, triangular,

round, or square, is named truly, for the points illustrated dovetail into corresponding holes in the aluminum die cast frame and, with the aid of a rubber gasket, make the frame waterproof, at the same time assuring a positive grip on the curtain.—Soss Manufacturing Co., Inc., Grand avenue and Bergen street, Brooklyn, New York.



"Grip-Tite" Curtain Light



Comer "All-Weather"

New Line of Raincoats

A manufacturer of guaranteed raincoats is making them in a number of different models, materials, and colors, for men, women and children. Some models are belted or half-belted, some have slash pockets and convertible collars, and some of the children's styles have a Billie Burke hood or sou'wester hat to match. The company also manufactures the "Blue Betty" household apron from blue and white checked material rubberized on the back. Sales are made through agents and sub-agents.—The Comer Manufacturing Co., Dayton, Ohio.

Bathing Cap with Inner Pocket

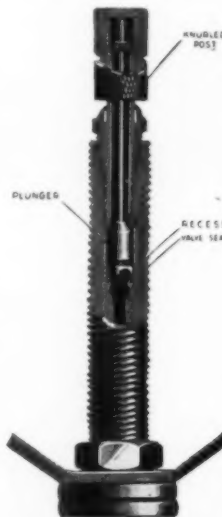
Dealers looking for novelties in the bathing cap line will be interested in the one shown here, inside of which, beneath the rosette, is cemented a small rubber bag with drawstring, into which may be put any small articles to protect them from the water. The cap is ruffled at the edge and is of solid color with white trimmings.—I. B. Kleinert Rubber Co., 719 Broadway, New York, N. Y.



Ruffled Cap—Pocket

High Pressure Valve

The Holt all metal valve, designed to retain high air pressure in tires on both pleasure and commercial cars, is operated mechanically by a hand-controlled screw. In the lower end of the plunger, which acts as a check during inflation, is a recess sufficiently elastic to form a seal without either seat being ground in. One and one-half turns of the knurled post open or close the valve.—All Metal Valve Co., 406 Kresge Building, Detroit, Michigan.



Holt Valve

had in heavy or medium weight in two sizes.—The same manufacturer also makes linemen's, electricians' and acid gloves.—The Aetna Rubber Co., 811 East 79th street, Cleveland, Ohio.

Tanner's Mitt

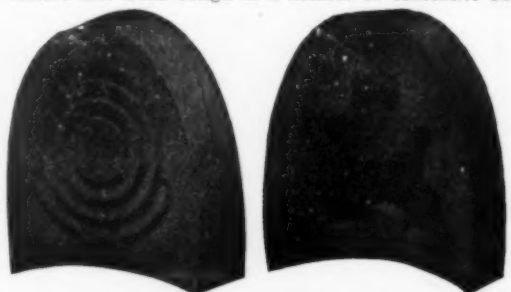
Seamless unlined mitts for tanners are made from high grade, chemical-resisting rubber and are steam cured. They may be



Tanner's Mitt

Vacuum Heel Has Circular Ridges

The "Doe-Boy" patented vacuum rubber heel combines its non-slip feature and tread design in a number of concentric circular



"Doe-Boy" Vacuum Rubber Heel

ridges. The nailholes are standard.—The Granger Vacuum Rubber Heel Co., 7930 Jones Road, Cleveland, Ohio.

Radio Device Multiplies "Listeners In"

The "Hipco Multiphone" permits four persons to listen in on any radio apparatus with only the regular receivers. One of these



"Hipco Multiphone"

is placed face down on the multiphone and held in place by elastic bands. From the multiphone extend four rubber tubes, each four feet long, branched like graphophone ear tubes, which the individual listeners adjust in their ears. Small bulbs exclude outside noise.—Hipwell Manufacturing Co., 825 North avenue, West, Pittsburgh, Pennsylvania.



McMillan Heel

Leather Plugs in Rubber Heel

To minimize danger of slipping, one inventor has inserted three sole leather plugs in suitable depressions molded in a rubber heel. The attaching nails have their heads countersunk in these plugs and a small space is left between the plug and the heel which provides the needed friction. The larger circular spots near the rounded edge of the heel illustrate where the plugs are located.—

Levi McMillan, 102 North 5th street, Wilmington, North Carolina.

Condensite in Auto Accessories

The advantages of condensite, a phenolic condensation product, for use in molded auto accessories are emphasized in the Eisemann distributor head pictured. These include glossy finish, high dielectric and mechanical strength, and resistance to acid, fire, oil and water. The metal inserts anchor firmly and the contact posts are set in a deep recess below the surface.—Condensite



Eisemann Distributor Head

Co. of America, Bloomfield, N. J.



"Arch Preserver" Heel

back of rubber inlaid in a special way. This gives resistance to the rotation of the arch and assures a firm tread base while overcoming noise and jarring.—The Selby Shoe Co., Portsmouth, Ohio.



Rubber and Leather Heel

To meet the demand for rubber heels on "Arch Preserver" shoes, the manufacturer has perfected a new type with the front of the lower portion of leather and the

Convenient Battery Tester

The "Ambu" battery tester, only six inches long, is convenient for testing storage batteries on cars, radio outfits, etc. Three colored balls—white, right; green, lean; red, dead—replace the glass float ordinarily used on hydrometers.—American Bureau of Engineering, Inc., 2632 Prairie avenue, Chicago, Illinois.

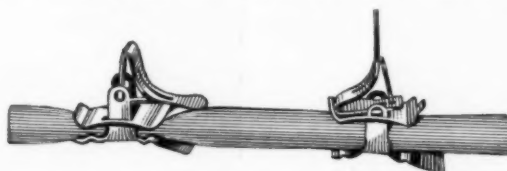


"Ambu" Tester

Tubing Shutoff with Double Contact

The "Duplex" shutoff, made of nicely finished brass which cannot rust, differs from the usual appliance used on syringes, hot-water bottles, laboratory tubing, etc. It has two points of contact with the tubing, preventing leakage.

A specially constructed, arm-strengthening lever, which cannot spring out of place, will not bend or break, even when used on heavy tubing, and the same compressor will shut off 3/16 to 5/16-inch tubing.—



"Duplex" Tubing Shutoff—Closed and Open

Brass Goods Manufacturing Co., 341 Eldert street, Brooklyn, New York.

Water Bottle Design Appeals

The fact that alligator skin conveys an impression of strength and durability, which it in fact lives up to, has been taken advantage of by a rubber manufacturer who has produced a brown rubber hot-water bottle designed to imitate alligator skin. This effect is produced by the most expert tooling of the mold in which the rubber is shaped, but the result is said to be highly successful.—The B. F. Goodrich Rubber Co., Akron, Ohio.



"Alligator" Bottle

Hard Rubber Case on "Airphone"

The "Airphone," a small crystal radio receiving set, 6½ by 4¼ by 2¾ inches, without switches, is encased in hard rubber. Interchangeable cartridge coils give



"Airphone" Radio Receiving Set

a 25-mile concert radius.—National Airphone Corporation, 16 Hudson street, New York, N. Y.

The Obituary Record

Former President of the Kelly-Springfield Tire Co.

VAN H. CARTMELL, one of the most popular and respected men in the rubber trade, died August 23, at his home in Springfield, Ohio.

Born and bred in Springfield, Mr. Cartmell began his business career while a young boy as a clerk in a small store there at \$5 a week, but he had the qualities of energy, integrity and alertness which made for success and soon connected himself with a manufacturing house of which he shortly became manager.

Coming East in the early nineties when solid rubber tires were in the pioneer stage, he became identified in 1894 with the Consolidated Rubber Tire Co., now the Kelly-Springfield Tire Co., as manager of its office in Boston, Massachusetts. Two years later he was put in charge of the larger office in New York, N. Y., and in 1903 was elected president of the company, a position which he held until impaired health necessitated his resignation in 1920.

Under his administration the Kelly-Springfield company prospered greatly and became one of the largest tire manufacturers in the world. For three years as first vice-president of The Rubber Association of America he gave freely of his sound judgment and executive ability.

An outstanding figure in the rubber industry for more than a quarter century, popular in both business and social circles, though a man of few hobbies aside from tires, his death will be regretted by a host of sincere friends and business acquaintances.



Van H. Cartmell

A Faithful Employee

Charles H. Hillman, for a quarter-century an employe of the Hood Rubber Co., Watertown, Massachusetts, and long in charge of a department there, died recently following a brief illness. He is survived by his widow and one daughter.

A Popular Crude Rubber Man

Clement B. McKay, well known in crude rubber circles, died on August 22 after a lingering illness at his home in Concord, Massachusetts. His obituary will be published in the October issue of THE INDIA RUBBER WORLD.

Superintendent William Kuhlthau

William Kuhlthau, for the past ten years assistant superintendent of the Millville plant of the Woonsocket Rubber Co., died August 15 after an illness of several months.

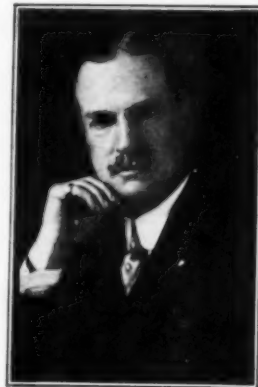
He was born in Milltown, N. J., in 1876, was educated in the public schools of his native town, and 30 years ago became interested in the rubber footwear industry. He had charge of footwear plants in Canada and later assumed the position of assistant superintendent of the Millville plant. He is survived by his widow, four sisters and three brothers. He was a member of the Masonic fraternity.

A Boston Raincoat Manufacturer

Everett L. Fuller, treasurer of the Franklin Rubber Co., raincoat manufacturer, 134 Federal street, Boston Massachusetts, died August 7, at his summer home at Center Harbor, New Hampshire, aged 62 years.

Mr. Fuller was born in Melrose, Massachusetts, July 1, 1860, and was educated in the public schools followed by a course in the Bryant & Stratton Business College, from which he graduated in 1876. The following year he obtained employment with Wortheley, Downes & Co., and in 1882 started in business under the firm name of Fuller, Leonard & Small. This business was incorporated as the Franklin Rubber Co. in 1901 with Mr. Fuller as treasurer, a position which he held until his death.

Mr. Fuller had been a member of the Melrose Sinking Fund Commission since 1912. He was a Mason and affiliated with many Masonic bodies. He is survived by his widow; a son, Lorin L. Fuller; two sisters, and a brother. His passing is regretted by many business associates, and friends in his home town, Melrose Highlands.



Everett L. Fuller

UNDERWRITERS' LABORATORIES' SERVICE EXTENDED

An arrangement has been entered into between the Fire Offices Committee, London, and Underwriters' Laboratories of Canada and the United States, covering the examination at factories and labeling of fire appliances manufactured in England intended for export to North America, the service being identical with that rendered by Underwriters' Laboratories for goods manufactured in Canada and the United States.

MOTOR AND ACCESSORY SALES INCREASE

Sales by members of the Motor and Accessory Manufacturers' Association for the first half of 1922 aggregated \$187,500,000, as compared with \$113,000,000 for the corresponding period in 1921. Sales for June of this year were nearly double those of June, 1921. Business was almost on the same level as in May. While business has been climbing upward there has been a sharp decrease in the volume of past due accounts. The total at the end of June, 1921, was \$4,720,000 and at the end of last June it was nearly \$2,840,000.

RUBBER PADDING MACHINE ROLLS

In dyeing cotton goods, care must be exercised in the use of the padder or padding machine and its rollers must be free from defects which might injure the fabric. These machines, resembling on a large scale the ordinary laundry wringer, are made with two or three rolls to suit individual requirements. "Squeeze" rolls for a two-roll padding machine have usually one roll of brass and the other of rubber, although sometimes both rolls are made of rubber. Where three rolls are used, the lower is usually composed of vulcanite or hard rubber, while the covering on the upper one is a softer rubber.

News of the American Rubber Trade

Financial

United States Rubber Co.

NET sales of the United States Rubber Co. for the six months ended June 30 amounted to \$73,933,771. Net income before interest was \$6,305,113, and after interest deductions totaling \$3,252,195 left net profits of \$3,052,918. Cash and accounts receivable amounted to \$56,752,000 and inventories of raw materials and finished goods to \$75,993,000. Total current assets were \$132,745,000 against total current liabilities of \$46,352,000. The surplus was \$30,231,456.

Through the operation of sinking funds the company has retired \$790,000 of its first and refunding mortgage 5 per cent gold bonds and \$180,000 of its 7½ per cent gold notes, thus reducing the funded debt \$970,000.

The company has arranged to retire, on December 1, 1922, all of its five-year 7 per cent secured gold notes, due December 1, 1923, amounting to \$6,000,000 by the sale of \$7,000,000 par value of its first and refunding mortgage 5 per cent gold bonds, Series "A," due January 1, 1947, being part of the bonds now deposited as security for the five-year 7 per cent notes, which are to be retired. This will effect a reduction of \$70,000 in the annual interest charges.

The entire issue was purchased by Kuhn, Loeb & Co., bankers, New York, N. Y., who are offering the bonds in denominations of \$1,000 and \$500 at 90½ and interest.

The American Zinc, Lead & Smelting Co.

The American Zinc, Lead & Smelting Co. reports for the second quarter of 1922 a profit of \$110,515 before depreciation and depletion charges. This compares with a profit of \$50,152 before the same charges in the first quarter of this year, and brings operating profits for the six months to June 30 to \$160,667. In the corresponding period last year the company operated at a loss of \$126,913.

The Miller Rubber Co.

Miller Rubber Co. sales during the first six months of the present year were \$12,119,741, as compared with \$9,445,822 during the same period last year. This is an increase of 28 per cent in value and almost 100 per cent in units. Net profits for the period amounted to \$1,026,317.

Dividends due September 1 were ordered paid September 15 on preferred stock, and \$1 a share of the accumulated dividends. The total payment will be \$3 a share. This leaves \$11 a share due on preferred stock.

The official statement reflects the reports which have been current since the first of the year that the company has been enjoying the greatest year in its history from a production standpoint.

The Goodyear Tire & Rubber Co.

Net sales of The Goodyear Tire & Rubber Co. for the six months ended June 30 were \$51,410,240, exclusive of subsidiary companies. Net earnings available for interest and other charges were \$5,501,793. The balance after all charges, amounting to \$1,915,889, was added to surplus which totaled \$5,535,933 as of June 30. Cash, treasury certificates and other marketable securities amount to \$18,151,092. Neither the company nor its subsidiaries have any indebtedness to banks. Current assets exceed current liabilities more than 10 to 1.

Goodyear production and sales during the first half of this year materially exceeded those of the corresponding period last year. Subsidiary operations, including export, are again on a profitable basis and contributing substantially to the firm's earnings.

Two Ames-Holden Concerns Merge

Ames-Holden-McCready, Limited, and the Ames-Holden Felt Co., Limited, both of Montreal, Canada, are to be merged as Ames-Holden, Limited. The Ames-Holden Tire Co., Limited, will remain an independent concern.

The plan contemplates an authorized capital consisting of 23,000 preferred shares, par value \$100, and 30,000 common shares of no par value. The company will in due course issue 25-year first mortgage 6 per cent gold bonds to the amount of \$2,500,000 and \$1,000,000 of these bonds will be sold at \$95 to provide working capital.

The preferred and common stocks of the merging companies will be wiped out, but Ames-Holden-McCready preferred shareholders will receive 25 per cent of the new common and Ames-Holden Felt common shareholders will receive 20 per cent of the new common.

Creditors of both firms will receive 60 per cent of their claims in 7 per cent preferred stock and 40 per cent common. First and second mortgage bond and debenture holders will receive the face value of their holdings in bonds of the new company plus 20 to 40 per cent of common stock. Approximately \$7,405,280 is involved in the reorganization.

Dividends Declared

COMPANY	STOCK	RATE	PAYABLE	STOCK OF RECORD
Boston Woven Hose & Rubber Co. Com.	\$1.50	q.	Sept. 15	Aug. 1
du Pont, E. I., de Nemours & Co. Com.	2%	q.	Sept. 18	Sept. 5
du Pont, E. I., de Nemours & Co. Del.	1½%	q.	Oct. 25	Oct. 10
General Tire & Rubber Co., The..	Pfd.	2%	Aug. ..	.....
Goodrich, B. F. Co., The.....	Pfd.	1½%	Oct. 2	Sept. 22
Lee Rubber & Tire Corporation... Com.	\$0.50	q.	Sept. 1	Aug. 15
Miller Rubber Co., The.....	Pfd.	2%	Sept. 15	Sept. 1
Miller Rubber Co., The.....	*Pfd.	1%	Sept. 15	.....
Mohawk Rubber Co., The.....	Com.	7%	July 11	June 26

* On accumulated back dividends.

New York Stock Exchange Quotations

AUGUST 25, 1922

	High	Low	Last
Ajax com.	12½	11½	12
Fisk com.	12½	12½	12½
Goodrich pfd.	87	87	87
Kelly-Springfield com.	44	43	43½
Lee com.	27½	26½	27
United States Rubber com.	56½	55½	56½
United States Rubber pfd.	104½	104½	104½

Akron Rubber Stock Quotations

Quotations of August 24, supplied by App-Hillman Co., Akron, Ohio.

	Bid	Asked
Firestone com.	73	77
Firestone 6% pfd.	90	90½
Firestone 7% pfd.	85	86
General com.	250	..
General pfd.	93	..
Goodrich com.	35	36
Goodrich pfd.	86	88
Goodrich 7% notes.	103½	103½
Goodrich 6½% bonds.	102½	103
Goodyear com.	9½	10
Goodyear pfd.	30	32
Goodyear priv. pfd.	64½	66½
Goodyear 8% bonds.	114½	115½
Goodyear 8% deb.	100	100½
India Rubber	75	..
India Rubber pfd.	80	..
Mason com.	10	11
Mason pfd.	50	55
Miller com.	70	75
Miller pfd.	98½	100
Seiberling com.	7½	8½
Seiberling pfd.	45	50
Star Rubber com. ....	..	25

New Incorporations

Antimony Products Corporation, June 9 (Delaware), \$6,000,000. R. K. Thistle; H. C. Hand; A. R. Myers, all of 65 Cedar street, New York City. Delaware agent, United States Corporation Co., Dover, Delaware. To deal in antimony for the rubber trade.

Beyerle Manufacturing Co., August 17 (New York), \$500,000. J. D. Farkas; E. Gross; A. Lefkowitz, all of 160 Fifth avenue, New York City. To manufacture rubber specialties, dress shields, etc.

Boulevard Tire Sales Co., August 3 (Delaware), \$5,000. S. H. Jones; A. S. Bishop; E. H. Fenster, all of Wilmington, Delaware. Principal office, 825 Orange street, Wilmington, Delaware. To manufacture and deal in tires.

Burnet Rubber Co., July 5 (New Jersey), \$50,000. J. H. Burnet, president; S. M. Stewart, treasurer and secretary; W. H. Burnet. Principal office, 525 Main street, East Orange, New Jersey. To manufacture rubber goods.

Chemical Rubber Co., The, July 19 (Ohio), \$50,000. H. Walfaw; M. Junke; M. Young; C. L. Brueggemyer; J. Brick. Principal office, Cleveland, Ohio. To manufacture rubber goods.

Clinton Tire & Rubber Co., July 25 (Delaware), \$100,000. C. H. Jarvis; L. B. Phillips; M. F. Vance, all of Wilmington, Delaware. Delaware agent, United States Corporation Company, Dover, Delaware. To deal in tires.

Emergency Road Service, The, July 3 (Ohio), 1,000 shares no par value. W. Eberly; C. A. Hope; I. J. Sloan; H. R. Palmer; C. F. Batey. Principal office, Cleveland, Ohio. To deal in tires and tubes.

Falls Tire Co., June 29 (Maryland), \$50,000. W. F. K. Jones, 3404 Fairview avenue; F. Wood, 1809 North Charles street; F. Kahler, 2061 Kennedy avenue, all of Baltimore, Maryland. Principal office, 2021 North Charles street, Baltimore, Maryland. To deal in tires.

Fischer, Carl, Tire & Rubber Co., June 26 (Illinois), \$3,000. C. R. Fischer; F. A. Winship; J. C. DeWolfe. Principal office, 1414 South Michigan Boulevard, Chicago, Illinois. To manufacture automobile tires and tubes.

General Tire Co., July 1 (Oregon), \$25,000. M. J. Woolach, president; W. L. Powell, vice-president and treasurer; C. H. Green, secretary. Principal office, 446 Stark street, Portland, Oregon. To buy and sell automobile tires.

Genesee Service Corporation, August 1 (New York), \$10,000. C. and M. C. Schenck; W. A. Monks, Jr., all of Syracuse, New York. Principal office, Syracuse, New York. To deal in tires.

Giant Rubber Products Co., May 5 (California), \$300,000. K. K. Parrott, 502 Exchange Building, Los Angeles, California. Principal office, 502 Exchange Building, Los Angeles, California. To deal in tires and rubber goods of all kinds.

Hamosax Manufacturing Co., June 8 (Maine), \$200,000. D. A. Hatch, treasurer, Bath, Maine; H. T. Hawthorne, president, Montclair, New Jersey. Principal office, Bath, Maine. To manufacture hard rubber substitute.

Hercules Rubber Products Corporation, July 29 (Delaware), \$7,000,000. W. Clearwater, 31 Ivy Place, Rutherford, New Jersey; P. M. Richards, 255A Brooklyn avenue; G. W. Bryan, 195 Monitor street, both of Brooklyn, New York. Delaware agent, United States Corporation Co., Dover, Delaware. To manufacture and deal in all kinds of rubber goods.

Hooker Tire & Supply Co., June 28 (Ohio), \$15,000. W. C. Taylor; J. B. O'Donnell; J. D. Ellis; R. C. Cronin; M. A. Wood. Principal office, 414 Walnut street, Cincinnati, Ohio. To deal in tires and tubes.

Jacobi & Brown, Inc., August 11 (New York), \$5,000. W. Brown, 477 Eleventh street; L. E. Jacobi and A. E. Lawson, both of 619 East 131st street, all of Brooklyn, New York. Principal office, 1335 Flatbush avenue, Brooklyn, New York. To deal in automobile tires.

Kasunda Supply Co., August 15 (New York), \$10,000. W. H. Robb; G. C. Job; L. Howlett, all of Syracuse, New York. Principal office, Syracuse, New York. To deal in mechanical rubber belting.

Kiel Development Co., June 12 (Wisconsin), \$1,500. W. C. Klemme, president; W. Eichhoff, vice-president; A. Wagenknecht, treasurer; G. T. Mottes, directory, all of Kiel, Wisconsin; J. E. Wildish, secretary, Milwaukee, Wisconsin. To try out the efficiency of patented articles and especially the patents known as the Alarm Tire and Wooden Shoe.

Lincoln Accessory Co., July 19 (Ohio), \$10,000. W. L. Henne; J. M. Herndon; R. Black; T. Jenhon. Principal office, 8th and Walnut streets, Cincinnati, Ohio. To deal in tires and tubes.

McCallum Anti Skidding Chain Tire Co., June 28 (Kentucky), \$10,000. D. B. McCallum, Berea; S. B. Wolley, Crab Orchard; I. G. Begley, Hazard, all of Kentucky. Principal office, Hazard, Kentucky. To deal in tires and automobile accessories.

Michelson Bros. & Co., July 26 (New York), \$15,000. Meyer Michelson, 1640 Grand Concourse; Max Michelson, 1665 Weeks avenue; M. Schneider, 857 Macy Place, all of Bronx, New York. Principal office, Bronx, New York. To manufacture supplies, tires, tools, etc.

Mid-West Rubber Co., July 28 (Ohio), \$25,000. G. A. Field, president and treasurer; L. V. Kimbel, secretary. Principal office, 18th and Chester avenue, Cleveland, Ohio. To manufacture rubber molded goods and automobile accessories.

Monmouth Vulcanizing Works, June 27 (New Jersey), \$50,000. J. Pilling, 211 Fourth avenue; R. Anderson, 771 Brinley avenue, both of Bradley Beach, New Jersey; B. Klein, 743 McDonough street, Brooklyn, New York. Principal office, Main street and Fifth avenue, Bradley Beach, New Jersey. To deal in tires and automobile parts of every kind and description.

National Composition Manufacturing Co., July 27 (Ohio), \$50,000. C. F. Schriener; E. R. Kelly; C. C. Scheible; W. M. Kinsley. Principal office, 3860 East 91st street, Cleveland, Ohio. To manufacture hard rubber products.

Non-Tube Tire Co., July 22 (New York), \$100,000. I. F. Trautman, 1909 52nd street; W. J. O'Farrell, 1387 Coney Island avenue; C. Stork, 798 St. Johns Place, all of Brooklyn, New York. Principal office, Brooklyn, New York. To manufacture tubeless rubber tires.

Oak Hill Rubber Co., July 28 (Ohio), \$125,000. W. A. Rydiger; G. W. Alden; J. F. Smith; O. M. Roderick; B. Hartman. Principal office, Oak Hill, Jackson County, Ohio. To manufacture rubber products, tires, etc.

Rickard, Tex. Life Preserver Corporation, July 31 (New York), \$1,000. G. L. Rickard; F. B. Flournoy, both of Madison avenue and 26th street; P. F. Shaughnessy, 418 Central Park West, all of New York City. To manufacture life preservers.

Roy Rubber Co., August 9 (New Jersey), \$100,000. E. L. Royal, 221 East Hanover street; H. W. Backes, Forst-Richey Building, both of Trenton, New Jersey; M. S. Royal, Morrisville, Pennsylvania. Principal office, 221 East Hanover street, Trenton, New Jersey. To manufacture, buy, sell and deal in any or all kinds of rubber goods.

Ryan & Gilfillan Co., The, July 31 (Ohio), \$50,000. I. A. Ryan; D. M. Gilfillan; E. Jeffers. Principal office, Ironton, Ohio. To deal in tires, tubes and automobile accessories.

Smith Rubber Products Sales Corporation, July 19 (New York), \$25,000. N. Levy, 124 West 115th street, New York City; M. Didshun, 356 Central avenue; H. Swiryn, 692 DeKalb avenue, both of Brooklyn, New York. To deal in tires.

Sound Rubber Sales Co., July 20 (New York), \$5,000. P. H. Latus, 2108 Avenue Q, Brooklyn, New York; J. F. Dempsey, 17 Hillside avenue, Rockville Center, New York; W. H. Phillips, 8827-88th street, Woodhaven, New York. Principal office, Rockville Center, New York. To deal in tires.

Standard Tire Co., June 22 (Pennsylvania), \$20,000. L. W. Bossard; P. B. Welsh; E. F. Grimm, all of Pittsburgh, Pennsylvania; J. L. Stahlnecker, Dormont; D. C. Uhrich, McKeesport, both of Pennsylvania. Principal office, Pittsburgh, Pennsylvania. To deal in tires.

State Tire & Rubber Co., June 17 (Indiana), \$75,000. P. Deutscher, president; S. Zukerman, vice-president; J. Deutscher, secretary and treasurer. Principal office, 204 South Illinois street, Indianapolis, Indiana. To buy and sell tires.

Stratford Rubber Manufacturing Co., June 17 (Illinois), \$1,000. S. H. Silverman; C. S. Peterson; C. D. Unger. Principal office, 1736 South Michigan avenue, Chicago, Illinois. To buy, sell and manufacture automobile tires.

Sumatra Rubber Specialties Company of New York, May 22 (New York), \$5,000. C. J. R. and H. D. Smith, all of 257 Water street, New York City. To manufacture rubber goods.

Supreme Rubber Products Co., July 24 (Ohio), \$325,000. R. H. Rhotchamel; W. R. Kerr; E. M. Ohman; R. M. Walker; J. H. Cox. Principal office, 733 Leader News Building, Cleveland, Ohio. To manufacture rubber tires, tubes and products.

Textile Rubber Co., May 29 (Massachusetts), \$50,000. J. E. Shannon, president, East Boston, Massachusetts; C. V. McManus, treasurer, and C. Strangman, both of Lynn, Massachusetts. Principal office, Boston, Massachusetts. To manufacture and sell leather, leather goods, rubber and any and all combinations thereof.

Times Square Auto Supply Co., May 13 (Delaware), \$3,400,000. J. Frechlich, president; L. Minzie, secretary and treasurer. Principal office, 1743 Broadway, New York City. To sell automobile tires, tubes, radio and other merchandise.

Yarger Vulcanizing Co., July 3 (Ohio), 500 shares, no par value. F. J. and F. A. Yarger; E. F. and M. E. Basky; E. E. Babione. Principal office, Fremont, Ohio. To deal in tires and tubes.

The Rubber Trade in the East and South Manufactured Goods

Generally speaking, the movement of rubber products has been good during the past month although the demand in certain lines was spotty. The activity in tire sales has continued, particularly the competition sizes being stimulated by further price reductions. Dealers' orders, however, are now largely for standard tires, showing that the consumer prefers the better tire. When this sentiment becomes general, automatic stabilization of the tire market will follow.

Heavy shipments of mechanical goods have been reported and the factories are doing good general business in spots. Buying, however, continues to be of the hand to mouth order.

Footwear factories are looking forward to a good fall and winter business. Insulated wire companies report increasing orders from the railroads for new signal and safety appliance supplies.

While no one knows what September will be, the indications are that the present business in manufactured goods generally will show substantial increases.

New York

The Ambassador Tire Corporation, as the Eastern representative for the tires of The Marathon Co., Cuyahoga Falls, Ohio, has recently leased the Ambassador Building, 240 West 55th street, New York, N. Y. In its new location the Ambassador company will be better able to handle its rapidly-growing business.

Maurice Switzer, vice-president of the Kelly-Springfield Tire Co., Broadway and 57th street, New York, N. Y., has been appointed a member of the Executive Committee, Advertising Managers' Council, Motor and Accessory Manufacturers' Association. Mr. Switzer has had a wide advertising experience, and in addition has made himself known as a writer and editor. In 1914 he joined the advertising department of the Kelly-Springfield company, becoming vice-president in 1917.

J. H. Lane & Co., selling agents for tire fabrics and other rubber fabrics, will occupy, on September 15, new quarters at 250 West 57th street, New York, N. Y.

Executives of the Middletown Rubber Co., Inc., Middletown, New York, report that their plant is now equipped to produce inner tubes, and that following the final installation of their rubber heel machinery, they will be ready to manufacture both lines of goods. Myron J. Friedman is president of the organization.

Lamson Asphalt & Chemical Co., Inc., 45 John street, New York, N. Y., importer and dealer in mica, asphalts, stearine pitch and wax, has succeeded John S. Lamson & Bro., Inc.

Pennsylvania

The B. C. Tillinghast Rubber Co., Inc., 236 Market street, Philadelphia, Pennsylvania, has been connected with the rubber industry for almost 50 years as jobber, manufacturer, and distributor. During the course of this firm's existence it has maintained three stores in Philadelphia, a rubber clothing factory at Frankford, Pennsylvania, and another store in Baltimore, Maryland. The organization was founded in 1876 by Benjamin C. Tillinghast, and since his death in 1918, has been carried on by some of his employees, who have all been associated with the company for many years. They include the following: J. K. Carr, president and general manager; James H. Beith, vice-president and sales manager; Adolph F. Dirrigl, assistant manager; and F. F. Crippen, secretary and treasurer.

The Goodall Rubber Co., Inc., Eighth and Locust streets, Philadelphia, Pennsylvania, manufacturer of mechanical goods for all purposes, reports a steady improvement in sales and that the August turnover exceeded that of any other month for nearly two years. Executives of this company include: Howard W. Goodall, president; Frederick B. Williamson, Jr., vice-president; Alfred W. Swartz, secretary and treasurer; B. J. L. Williams, assistant secretary; and H. J. Behr, sales manager.

B. M. Cullen, vice-president of the United & Globe Rubber Co., Trenton, has removed his office to 804 North Broad street, Philadelphia, Pennsylvania. This branch, which carries a complete stock of U. & G. belting, packing and hose, will fill all but exceptionally large orders from this territory, insuring quick service.

The Mason Tire & Rubber Co., Kent, Ohio, has opened a new branch office and warehouse at 6305 Penn avenue, Pittsburgh, Pennsylvania, with R. W. Mason as manager. This office will serve the western half of Pennsylvania and the northern half of West Virginia.

Southern Notes

R. B. Tracy, previously connected with the Globe Rubber Tire Manufacturing Co., and later with the Michelin Tire Co., is now director of sales for the Paul Rubber Co., Salisbury, North Carolina. This organization, now in production at its new plant, which has a capacity of 500 casings a day and 2,000 tubes, is planning also the equipment of a tire valve factory. All tubes manufactured by this company are to be equipped with Tirometer valves.

Following the resignation of W. F. Smith, C. C. Harper has been elected president and general manager of The Doss Rubber & Tube Co., Atlanta, Georgia. The firm specializes in the manufacture of "Doss" tires.

J. P. Crouch has been recently appointed overseer of the waste department of the Hillside Cotton Mills, La Grange, Georgia. He was formerly connected with the Unity Spinning Mills, also of La Grange, both plants forming part of the Fuller E. Callaway organization.



R. B. Tracy

The Rubber Trade in New Jersey

Manufactured Goods

It has seldom occurred, even in far more prosperous periods, that the rubber factories of Trenton have been so busy as in the last few months. The usually looked for business slump after July, especially in the tire branch of the industry, has failed to materialize this summer. The result is that every rubber factory of any consequence in Trenton is normally busy while many are working overtime. This applies to the tires as well as the mechanical goods. Belting, hose of all kinds, packing, heels, soles, and all other kinds of molded goods are being made almost to full capacity. Some local companies report that they have business enough booked for future delivery to keep up this activity for many weeks to come.

Master in Chancery John V. B. Wicoff, of Trenton, New Jersey, has been appointed receiver of the Semple Rubber Co. by United States District Judge Bodine, following a petition that the rubber company was insolvent. Business conditions during the past year have adversely affected the operation of the Semple company, and it owes \$146,030 on notes and accounts which it is unable to pay. It is alleged that the company has virtually no cash on hand, but the petitioner expresses the belief that if the company is continued in operation under the direction of the United States Court that it may meet its obligations ultimately.

Trenton

The Acme Rubber Manufacturing Co., Trenton, continues to operate on an overtime schedule. Its monthly mill room tonnage for the last three months has exceeded any previous record. Nearly all the lines it manufactures are sharing in this excess activity.

The Essex Rubber Co., Trenton, reports an unusually good demand for its products. This company has greatly increased its output and is now one of the largest manufacturers of rubber heels and soles in the country.

The Hamilton Rubber Manufacturing Co., Trenton, is operating full time and is very busy in its belting, jar ring and cotton rubber lined hose departments.

The Home Rubber Co., Trenton, is enjoying a good demand for its special products of which it makes a great many in the packing line. Business in other departments is very good also, and thus far there is no evidence of the usual summer dullness.

All of the local Trenton hard rubber factories—Joseph Stokes Rubber Co., Luzerne Rubber Co., and Vulcanized Rubber Co.—report very satisfactory business.

The affairs of the Woven Steel Hose & Rubber Co., Trenton, are being managed by R. W. Tobin and H. B. Skellenger in the absence of H. B. Tobin, president and general manager of the company.

The business of the Whitehead Bros. Rubber Co., Trenton, is under the management of Samuel Cadwallader, who continues to take care of the clientage of this hose concern in a very satisfactory manner.

Horace B. Tobin and Mrs. Tobin, E. B. Fulper and Mrs. Fulper, Trenton, are expected back from Europe early in September. Captain Ernest Buckleton, well known in the rubber trade, met them in London, and aided much in making their stay enjoyable.

Frank W. Wolff, assistant superintendent, Dunlop Rubber Co., Melbourne, Australia, has been spending some time visiting the Trenton rubber plants as well as other factories in this vicinity. Mr. Wolff is seeking information on the manufacture of mechanical goods.

The Miller-Steiner Co. will shortly enlarge the rubber mat and stair tread departments, where the business has increased about 300 per cent during the summer months. The company specializes in molded goods. Veselin G. Kirow, formerly in charge of the testing laboratory of the Boston Woven Hose & Rubber Co., Bos-

ton, Massachusetts, and later with the Empire Tire & Rubber Corporation, has been made secretary in place of Julius D. Steiner, resigned. The concern expects to change its name.

After having been confined for almost a week in Mercer County Jail, Herbert W. Kugler, former president of the Globe Tire & Rubber Co., accused of embezzlement of the company's funds, is at liberty on \$20,000 bail, secured from a bonding company. Kugler was arrested in San Francisco several weeks ago and was brought back to Trenton for trial. He pleaded not guilty when arraigned before Judge Marshall in Mercer County Court.

Albert Numbers, who left Trenton some time ago to become general manager of the Virginia Rubber Co., at Charleston, West Virginia, has returned to Trenton, where he will become a jobber in tires.

Conrad Scollard, of Springfield, Massachusetts, efficiency expert of the Empire Tire & Rubber Corporation, will shortly remove to Trenton, where he will make his home permanently.

The Ajax Rubber Co. has connected all of its factory buildings with steel bridges to facilitate movement of employes and stocks, especially in bad weather. The company also recently erected an addition.

The Grizzly Rubber Co. has secured the Trenton agency of The Mason Tire & Rubber Co., Kent, Ohio. Richard Rogers, president of the Grizzly company, is well known in the tire industry, having been identified for a number of years with the Empire Tire & Rubber Corporation both in the manufacturing end and as a salesman.

Empire Reorganization Plans

A plan for the reorganization of the Empire Tire & Rubber Corporation, and the formation of a new company for the purpose of acquiring its assets at the public sale ordered by the United States District Court to be held on September 13, has been submitted to the creditors. It is proposed to settle outstanding indebtedness by issuing new securities, and at the same time and through the same means to secure a ready cash working capital of about \$500,000. The indebtedness of the corporation amounts to \$2,018,532.32 as of August 1, the date of the proposed plan. It is proposed to issue the following new securities: \$600,000 6 per cent two-year notes for cash; \$800,000 6 per cent gold notes; \$1,200,000 7 per cent cumulative preferred stock of the par value of \$100 per share, and 40,000 shares of common stock without par value.

The terms of the agreement provide that a committee of trustees composed of W. T. Baird, H. J. Lyall, R. S. McKinley, A. W. Pickford and former Governor E. C. Stokes, are to acquire the plant and its assets at the public sale, and afterwards form the new company. It is proposed that each creditor shall receive for each \$1,000 of indebtedness \$400 in 6 per cent gold notes, \$600 in 7 per cent preferred stock, and ten shares of the common stock of no par value. Common stock amounting to 20,000 shares is to be reserved to apply as bonus with the short term notes, and as additional compensation to those connected with the active management of the new company.

New Jersey Notes

The Lambertville Rubber Co., Lambertville, New Jersey, has increased its authorized capital stock to \$750,000. Extensive improvements will be made at the factory shortly and additional hands placed at work. The company has many orders on hand and has bright prospects for the future.

Entertainment features form an interesting part of the program for the annual fall convention of the National Association of Cotton Manufacturers, to be held at the Hotel Traymore, Atlantic City, New Jersey, October 4 and 5. One of the members of the entertainment committee is Harry W. Butterworth, of H. W. Butterworth & Sons Co., Philadelphia, Pennsylvania, manufacturer of finishing machinery.

The manufacture of fabric tires has been discontinued by the Michelin Tire Co., Milltown, New Jersey, except in the 30 by 3½ size. Hereafter the company will specialize in the manufacture of regular size cord tires, a specialty of the Michelin concern.

The Combination Rubber Manufacturing Co., Bloomfield, New Jersey, is manufacturing a new cord casing with flat profile. This is expected to become an important addition to their tire line. The new tire is fully as striking in appearance as the "Viking," and embodies the same qualities.

The Spartan Rubber Co., Yardville, New Jersey, is operating full schedule, ultimately looking towards a daily production of 500 casings and 1,000 tubes. The officers and management are ambitious to not only increase the product of their plant but also to build up a reputation for actual merit of product.

The Rubber Trade in Rhode Island

The present coal shortage and the prophetic possibility of a continuance for at least a year, will affect the local factories less than such circumstances would have done at previous times. Since the last emergency in the coal situation the mills of all kinds throughout this section have been gradually converting to oil burning equipment, yet the amount of storage coal in factory yards is large. Possibly such supply would last but a short time if the oil fuel was not used, but with the combination it is believed that the situation is not so serious as to handicap industry materially.

Prospects for an active fall and winter are believed by the management of the various plants to be very promising, as reports indicate that throughout the country the wholesale and retail stocks of all kinds of rubber goods, especially boots, shoes and arctics, are low and with an ordinarily severe winter the prospects are bright for continued operations.

During the summer there has been a general and in most instances a most thorough overhauling and repairing of machinery, power equipment and everything made ready for a revival of active operations. All the rubber plants of Rhode Island have made preparations for any demands that may be made upon them and with anything like a normalcy of demand they should be running at practically normal production for the greater portion of the coming winter.

The two plants of the Woonsocket Rubber Co.—the Alice Mill at Woonsocket, producing rubber shoes, and the Millville Mill at Millville, producing rubber boots—are both running well at this time, with encouraging futures. The former is being operated on a five and a half days a week schedule and the latter on a five days' card.

At the Revere Rubber Co. and Davol Rubber Co. plants in Providence, good business is reported with some orders on hand and good prospects. Bathing suits and accessories, novelties and similar goods are prominent among the former's output while the Davol druggists' supplies keeps things moving. The latter concern has gradually taken over the different sections of its large block purchased a few years ago, as fast as the tenants have given up their quarters, until it is now occupying the entire structure. This has afforded the opportunity of transferring entire departments connected with the executive, administrative and shipping to the acquired building and allowed of a general enlargement and rearrangement of the manufacturing departments in the regular plant. The company is continually expanding its plant and within the last few weeks has been granted permission to erect an addition to its pump house at 69 Point street.

The National India Rubber Co., which closed its plant at Bristol, with the exception of the wire department, on July 28, began the resumption of operations by starting up the machine cutting department in the keds division August 21, and the following day the stitching department took up its work. The various departments were opened in regular succession so that all were in operation for the first making date on August 28.

The force now employed consists of about 3,300 people, exclusive of the 250 engaged in the wire division, and the plant is being operated on a five days a week schedule. The present indications are that the plant will give steady employment for some months to follow, the management being optimistic as to the possibilities of good business the coming season provided goods can be produced at a lower cost. At a recent joint meeting of the Factory Council representatives and members of the management, a lengthy discussion was held as to reducing manufacturing costs during the ensuing year. Many suggestions were received from Factory Council representatives as to savings which could be made and, with the resumption of operations, small department meetings are to be arranged for, at which the possible improvements in the various manufacturing departments will be considered in detail and the policy for the coming year decided upon at an early date.

The dyeing department of the Lawrence Felting Co., at Millville, began operation on full time on August 14, after an extended shutdown due to the lack of orders.

Providence

Despite the rain, employees of the Revere plant of the United States Rubber Co. and their friends held an enjoyable outing and clambake, August 13, at the Warwick Club. Four chartered trolley cars left the Union Station, Providence, at 10 o'clock with the pleasure seekers for the ride of twelve miles through the country overlooking Narragansett Bay. Several of the scheduled athletic events were run off in the morning previous to the serving of the bake which was held at 1 o'clock in the main dining rooms of the club. The baseball game between the married and single men was held in the afternoon, after which there was dancing. The married men won handily from the single men in the baseball game. Tugs of war between men's teams and women's teams were features of the program, while a quoit match between two picked departments attracted considerable attention, being won by the thread department team.

The Invincible Tire Co., Providence, has increased its capital stock from \$25,000 to \$50,000, according to an amendment to its charter that has been filed in the office of the Secretary of State.

The Outlet Co. (J. Samuels & Bro., Inc.), corner Weybosset, Eddy, Pine and Garnet streets, has become the exclusive distributor in Providence of Superior cord and fabric tires.

The Excello Manufacturing Co., Inc., of 923 Westminster street, Providence, manufacturer of gas tubings, has increased its capital stock from \$25,000 to \$50,000, according to an amendment to its charter filed in the office of the Secretary of State.

The Rubber Trade in Massachusetts

Manufactured Goods

Following the annual summer vacation shut-downs and plant and machinery overhauling, the rubber footwear factories have resumed operations with a promising season before them. Orders for heavy footwear are booked well ahead, and in response to the appearance of the new tennis price lists the orders being received for delivery next season indicate a healthier trade tone. Tire factories continue to be busy with very little indication of diminution during the automobile driving season. Clothing lines remain quiet, though manufacturers are bringing out new and attractive models in anticipation of a brisk autumn trade. The railway and coal strikes are affecting somewhat the anticipated volume of mechanical goods orders for future delivery. The demand for insulated wire and auto topping continues satisfactory, and rubber heel production is well maintained. Drug sundries business is still quiet, and the expected rush for hard rubber radio parts for autumn business will hardly develop for another month. As the crude rubber situation offers no promise of early relief, most re-

claimers are developing specialized lines of molded rubber goods, notably heels, soles, mats and flooring, for the purpose of consuming their product.

Boston

At the National Shoe Style Show held in Boston recently, Larkide soles, the product of the Larkide Co., 201 Devonshire street, attracted much favorable attention because of their unique qualities combining the merits of both rubber and leather. Larkide soles can be channeled and bottom-finished like sole leather, and their edges may be burnished and set with exactitude. They can be stitched with any thread or awl adapted to sole leather. Having the fine appearance of sole leather, they are said to be waterproof, non-cracking, non-checking, non-skidding and not to depress nor burn the feet.

The Summer Rubber Co., H. I. Aronson, proprietor, 77 Bedford street, Boston, which began jobbing operations last November, reports an excellent business in mechanical rubber goods seconds, the chief difficulty being to get the goods. John Woolf is New England representative.

The Clifton Manufacturing Co., proofers and rubber clothing manufacturers, Jamaica Plain, is opening a Boston sales office at 99 Chauncey street. N. Lincoln Greene, formerly of the United States Rubber Co., clothing division, and well known in New England trade circles, will be in charge.

The Interstate Commerce Commission has granted authority to the Merchants' and Miners' Transportation Co. to reduce rail-and-water rates on rubber footwear 29.5 cents per hundred pounds on less than carload quantities and 16.5 cents on carload quantities, and to increase rates on leather footwear 2 cents per hundred pounds on its lines from Boston and Providence, Rhode Island, to Richmond, South Richmond and Petersburg, Virginia. This makes the rates on all kinds of footwear the same.

The executive personnel of the Cooper Tire & Battery Corporation, 186 Brookline avenue, Boston, Massachusetts, has been recently increased by the appointment of J. B. Waddell as vice-president in charge of sales. Mr. Waddell, who is well known in New England, was previously connected with the Boston branch of the Firestone Tire & Rubber Co., Akron, Ohio. The Cooper organization manufactures tires, batteries and battery parts, rectifiers, portostats, etc.

The Salmon Falls Manufacturing Co., 50 State street, Boston, Massachusetts, specializing in tire fabrics, has begun rebuilding and enlarging its waterpower plant. When these alterations are completed 3,000 h.p. will be developed.

Captain Francis H. Appleton, Boston, has just returned from a visit to the Pacific Coast. The beginning of the journey was taken with the Shriners and included a visit to the Hawaiian Islands. At the close of the convention he spent a couple of weeks visiting friends and business acquaintances in Los Angeles, San Francisco, Portland and other centers, returning by way of the Canadian Pacific.

Massachusetts Notes

Operations were resumed August 14 at the plant of the Converse Rubber Shoe Co., Malden, Massachusetts, following the usual vacation shut-down. Late orders for canvas footwear kept this department in partial operation during this period, however. The heavy rubber footwear season now beginning promises to be a busy one with orders booked well in advance. The company has recently installed paper box machinery having a capacity of 10,000 to 12,000 boxes daily.

Owing to its direct to consumer campaign the Converse Tire Co., Malden, is having no difficulty in marketing its present production of 250 casings and 500 tubes daily.

The Malden plant of the Boston Rubber Shoe Co. reopened August 21 after a two weeks' vacation shut-down for the 1,500

employees, during which various repairs to plant and machinery were made.

The Monatiquot Rubber Works Co., South Braintree, Massachusetts, has increased its capitalization to \$600,000 by the issue of 2,500 shares of common stock, par value \$100, and 3,000 shares of preferred stock, par value \$100. A 500 per cent stock dividend has been declared to former common shareholders. The company was incorporated in 1909 with a common capital of \$50,000, which has never been changed. The increase in capital at this time is merely the capitalization of surplus. The firm has largely developed its business in Stedman Naturized flooring and is not as active in reclaiming as formerly.

Damage estimated at several thousand dollars was caused by a fire of unknown origin early in August in the two-story brick building at 135 Everett avenue, Chelsea, Massachusetts, owned by Max Leitman and occupied by him as the Retread Tire Co.

The Cambridge Rubber Co., Cambridge, Massachusetts, has begun the erection of a four-story concrete factory building approximately 100 feet square which will be occupied about November 15 for the manufacture of rubber and canvas footwear. The company has had a very successful year, is now very busy, and its volume of orders for future delivery indicates a better tone in the retail trade for the coming season.

Officials of the Hood Rubber Co., Watertown, Massachusetts, state that the company's sales for the first five months of 1922 represent an advance of \$1,200,000 over those for a similar period in 1921.

The veterans in the New England rubber trade will recall Charles T. Wood who for many years was connected with Charles M. Clapp and the Aetna Rubber Mills. Some years ago, Mr. Wood gave up active business and moved to Los Angeles. He is still a resident of the City of the Angels, hale, hearty and eighty.

The Rubber Trade in Ohio Manufactured Goods

Production of rubber goods in the Akron district during the third quarter of the year continues unabated. The demand for tires has seemed endless. Months after a curtailment in the tire industry was forecast, production continues at top speed.

Excise tax figures have increased by more than one-third during the past four months, according to the Akron Internal Revenue Bureau. This indicates to what extent the tire business has increased during the period mentioned. Authorities still predict that curtailment will probably come in September, but the transition from summer to winter production will not be so marked as commonly. Preparations are being made for fall business. To a large extent, trade acceptances will be utilized to finance the spring delivery goods. Prices, which during the month hit bottom, have paved the way for the fall trade, and further reductions would be a surprise to even the most pessimistic in the industry.

With regard to mechanical goods, the railway and coal strikes came at a most critical period. Shipments were held up and an artificial demand was created which resulted in artificially increased prices. When the strikes end, the demand for mechanical goods will increase materially, both because of accumulated orders and the normal business increase which has been registered during the entire year.

Boot and shoe departments are unusually busy for this time of the year. Dealers throughout the country started to replenish their stocks several months ago and the so-called dull period is an unusually busy one. Heel production is swinging along at the record set in June and July, and is constantly increasing.

Druggists' sundries have been selling actively for this time of the year and these departments are running well. Specialties have continued to find a very good market and factories either making

these exclusively or as a side line are registering a very good trade.

Hard rubber products, because of the activity in the automobile industry, continue to be in good demand, although radio parts have felt a little lull during the summer months.

In tires, cords continue to show increases over fabrics, although several of the smaller factories south of Akron are reported to have recently shown an increase in fabric production.

Owing to the strikes, automobile tire fabric buying has been steady during the month, both for spot delivery and future. Prices have been firm, although they have not risen with the cotton market. Too much strong competition in the manufacturing of automobile tire fabric is largely responsible.

The bathing novelty season just closed has been one of the best in the history of the industry.

Firestone Activities

The Firestone Tire & Rubber Co. continues to operate its Akron plant at previous production figures while making preparations to place the Canadian subsidiary at Hamilton, Ontario, and the new steel products plant at Akron in full operation. By the middle of September a large heel production will be started at Akron. Several large manufacturers' accounts have already been obtained and others are expected. Production at the Firestone-Apsley footwear plant at Hudson, Massachusetts, is high and preparations are being made for increasing it during the fall.

The results of efforts to reduce accidents in rubber factories is illustrated by the eight months' record of the Firestone Tire & Rubber Co., which lost only 200 days on account of accidents and had no time loss accidents in 19 of its 31 departments during that period. When it is remembered that Firestone has more than 13,000 employees in its Akron plant, this record is very unusual.

Homer C. Campbell, for the past year and one-half chief administrator of the city of Akron, has resigned to accept a position as assistant treasurer of the Firestone Tire & Rubber Co. Mr. Campbell for a time was in charge of real estate for the Firestone company and also was in charge of the Home Owners' Investment Co., organized to build homes for workingmen. Mr. Campbell will be succeeded by M. P. Tucker, formerly with the Firestone Tire & Rubber Co., who has been service director of the city for the past six months.

Goodrich Maintains July Records

The B. F. Goodrich Co. is maintaining its July output record. Tire production, primarily for the dealer trade, is well above the 22,000 mark; production of mechanical goods has not been affected by either the coal or the railroad strikes; boot and shoe departments are busy with orders received several months ago, and the output of other goods continues to show increases.

The company has let contracts for the completion of one of the buildings which was started before the depression and will occupy parts of the building not yet finished as rapidly as they are completed.

While sales during the first half of the year were only \$39,000,000, the showing for the second half in all probability will be much larger because the company was compelled to wait for business longer than some of the other companies because of its reluctance to accept original equipment tire business from automobile manufacturers.

Goodyear Activity Continues

The Goodyear Tire & Rubber Co. reported sales of \$51,410,240 for the first six months of the present year, as compared with \$82,195,550 for the last ten months of 1921 and \$205,000,000 for the whole of 1920, the peak year of the company's history. A large portion of the decrease is attributable to the reduced tire prices which have obtained during the period, and because of this fact do not reflect the speed with which the plant has been operating.

Production at the present time remains above 26,000 tires a day, while the mechanical goods, heel, and aviation departments continue to show increases. August sales of tires will probably equal or even exceed those of July, which in turn were larger than those of June, when the company sold and shipped a record number of tires and tubes. During that month the shipments amounted to 779,590 tires, while the previous high record was made in March, 1920, when shipments totaled 734,948 tires. Reports from subsidiaries at Toronto, Canada, and Los Angeles, California, indicate that the same condition obtains in these plants.

Two New Miller Tires

The Miller Rubber Co. has placed upon the market a new line of low-priced cord tires, known as the "Wedge" tread, and also a new line of fabric tires called "Rellim." While the new cord tires will be made in all sizes within the next month or two, production is now confined to the Ford size, which sells for \$12.50. Production of the new fabric tires is likewise confined for the present to Ford sizes, although this line also will be extended in the very near future.

The Miller company continues its large production of rubber balls of all kinds, and the entire plant is operating at new high records.

Mason Tire Fabric Plants at Full Capacity

In order to meet increasing demands for its products The Mason Tire & Rubber Co., Kent, Ohio, is now running its tire fabric plants at full capacity. Although by this schedule the Mason organization will have 7,000,000 pounds of fabric annually for its exclusive use, this amount, according to executives of the company, will not meet requirements, and additions to the textile plants will soon become necessary.

At Millen, Georgia, 30,000 pounds weekly of chafer and square-woven fabric are being produced, while the Quitman mill is also operating twenty-four hours daily on square-woven fabric. This latter plant, however, is being rapidly changed over to production of cord fabric exclusively, and will manufacture 60,000 pounds weekly when the change is made. At Kent, Ohio, the textile division of The Mason Tire & Rubber Co. is producing 50,000 pounds weekly of cord fabric only. H. R. Whitehead is general superintendent of the Quitman plant, known as The Western Reserve Cotton Mills Georgia Co.

Akron

More than 40,000 Fordson tractors are now equipped with rubber tires. Henry Ford compelled his dealers to take a definite proportion of farm tractors with their car orders. The dealers found, however, that it was impossible to sell their quota to farmers, with the result that they are placing them in industrial and commercial work. This makes it necessary to equip the machines with rubber tires. Standard pneumatics will fit the tractor, but special solid tires are required. This and the bus field, which is constantly increasing, are looked upon as two of the largest undeveloped markets for tires.

Europe is attracting rubber men, and while some are returning others are either already there or preparing to go. During the past month P. W. Litchfield, factory manager of The Goodyear Tire & Rubber Co., and G. W. Sprowls, of the same company, returned from extended visits to the Continent. Harvey S. Firestone, president of the Firestone Tire & Rubber Co., is among the rubber leaders now in Europe, while Gustav Clemmens, of the Firestone Bank, and W. O. Rutherford and L. D. Brown, of The B. F. Goodrich Co., have recently arrived there. The consensus of opinion of the travelers is that Europe has still a long way to go before it will again be able to produce rubber goods as before the war.

The Rubber Products Co. is now operating on druggists' sundries at full time with one shift a day. The prospects for fall are very good.

The Hermann Tire Building Machine Co., St. Marys, Ohio, will be represented in the Akron district by White & Co., 602 Flatiron Building, Akron. Mr. Mell, of the latter concern, will be in charge of the sales promotion for the Hermann tire building machines in this vicinity.

The India Tire & Rubber Co.'s sales have more than doubled during the past four months, including a good export business. Preparations are still in progress for the production of a new high-priced tire. Net earnings for the first six months of the year amounted to \$214,419, or 30 per cent on the outstanding preferred and common stocks. Business during the last seven months amounted to \$1,088,000, an increase of 46 per cent in value and more than 80 per cent in units over the same period last year. The present year promises to be the largest in the history of the company.

The Mohawk Rubber Co. reports production at about 900 tires a day, against a total capacity of 1,100 to 1,200 a day. The present tire production is looked upon as the peak for this year, although it probably will be easily maintained for at least another month. R. M. Shively, formerly with The Goodyear Tire & Rubber Co., has joined the company as advertising and export manager. Mr. Shively recently spent much time in the Far East.

The American Hard Rubber Co. has increased production very close to normal during the past three months. Most of the increased business has originated with the automobile manufacturers. The summer months have seen a slight reduction in the production of radio telephone equipment, but indications point to a revival early this fall.

Amazon Rubber Co. sales for July and August are far ahead of sales during the same months last year. Sales and production are close to 350 tires a day, as compared with 150 tires sold and made last year during the same months. The large increase in business is attributed to low-priced cord tires which were placed on the market several months ago.

The American Rubber & Tire Co. is operating at capacity. The company has closed its bathing shoe department for the year after more than tripling the business done last year.

The Star Rubber Co. is producing more tires than at any period during the past two years. C. E. Armstrong, formerly with the company, has returned to its sales department.

The Gregory Rubber Co., manufacturer of rubber specialties, reports that production during the past few months has been highly satisfactory, although last year's figures have not been exceeded. Last year was reported to be one of the best in the specialty business, chiefly because of the large number of new articles placed on the market. Foreign competition has not been felt by the company this year in any noticeable degree, although early this year it was forecast that some of the lower-priced foreign merchandise might cut into American markets.

White & Co., Akron, sales agents for crude rubber, materials and equipment, announce that Tod J. Mell, who has had more than twenty-five years' experience in the rubber industry, will take charge of the firm's machinery and equipment division.

The Firestone Steel Products Co., Firestone Park, Akron, Ohio, is at present moving machinery and equipment into its new factory building erected about a year ago, but not occupied until the recent increasing demands for Firestone products had made it necessary. The process of removal may take three months. The new location represents approximately five acres of floor space, a garage with a capacity for 100 cars, and a two-story administrative building.

The Lambert Tire & Rubber Co., Akron, Ohio, manufacturer of "Trublpruf" cushion tires, reports an excellent market for its product not only in this country, but also abroad, while sales for the first six months of this year have been double those for the same period in 1921. The company has recently installed new vulcanizers and is now purchasing mill equipment that will triple the

plant production, now the largest in the history of the organization. G. M. Collette is general manager.

Ohio Notes

The Lancaster Tire & Rubber Co., 168 East Long street, Columbus, Ohio, has recently leased a three-story building in that city, at the corner of Fourth and Elm streets. Rapidly-developing business in the Columbus territory has necessitated this removal to larger quarters by the Lancaster organization, whose executives include: E. E. Lerch, president; O. H. Williams, vice-president, and J. L. Porter, secretary. The latest addition to the company's office personnel is the appointment as sales manager of G. T. Currier, formerly director of export sales with the Firestone company.

H. H. Forrest has been appointed superintendent of the plant formerly owned by The Owen Tire & Rubber Co., Bedford, Ohio, recently purchased by the Mason Tire & Rubber Co., Kent, Ohio. Mr. Forrest was previously for two years in the employ of the Mason organization, acting as superintendent of that company's Kent plant. Following this he became general superintendent for the Erie Tire Co., Sandusky, which position he held until his present appointment.

Operations at the New Castle and Barberton plants of the Seiberling Rubber Co., Akron, Ohio, are now being carried forward on the basis of practically monthly turnovers of stocks, no surplus goods being manufactured. Officials report that daily production at present ranges at both plants between 2,000 and 2,500 tires, and the same number of tubes, while on August 1 the number of dealers employed by the company approximated 2,800.

Production at the plant of The McGraw Tire & Rubber Co., East Palestine, Ohio, has increased to 2,500 tires and 3,600 tubes daily, while a 24-hour schedule is in operation. Officials report a decided improvement in sales, while prospects for the balance of the year indicate a continued high peak of manufacture.

Optimistic reports from the Renown Rubber Co., manufacturer of rubber novelties and toy balloons at Bryan, Ohio, state that the plant production of transparent toy balloons averages 80 to 100 gross daily. An increase to approximately 300 gross daily is now being planned, as well as the manufacture of other kinds of dipped goods. H. H. Hoberg and J. E. Smith constitute the firm.

The recently-organized Benlur Rubber Co., 312 Eighteenth street, Toledo, Ohio, is the northern Ohio and southern Michigan distributor of Ajax tires, tubes, and accessories. Benjamin Love heads the new company, while Russell S. Lamb is sales manager.

Operations are now going forward at the newly-acquired plant of The Mason Tire & Rubber Co. at Bedford, Ohio, where the new Mason "Maxi-Mile" cord tire for small cars is being exclusively manufactured.

The Trump Rubber Co., which was started early this year by E. H. and R. M. Trump, formerly with the Excel Rubber Co., at Wadsworth, reports that production of men's belts has risen to 46,000 a day, and women's belt production, after only a few months' operation, has risen to 3,000 a day. Radio parts business is doing well. Tire production will be started on a small scale early in September.

Stockholders of the Liberty Tire Corporation at Carey, Ohio, have petitioned the Federal Court at Toledo for a Federal receiver of the company, following the appointment of a receiver for the company in the Common Pleas Court of Wyandotte County. Q. H. Schwartz, sheriff of the county, has been acting as temporary receiver. Difficulties arising between the parent company and subsidiaries are said to have led to the petition. The plant has been shut down pending the outcome of the suits.

The Clinton Tire & Rubber Co., of Port Clinton, formerly the Ohio State Rubber Tire Co., which was taken over by a group of stockholders at the receiver's sale last month, will be in operation in about a month. The plant has a capacity of 1,000 tires a

day. The assets of the company are placed at \$300,000 and liabilities between \$300,000 and \$400,000. W. W. Wildman, president of The Wildman Rubber Co., formerly with the Portage Rubber Co., at Barberton, is associated with the new company and will probably be its president.

American Tire Exports Increasing

Recent tabulations completed by the foreign department of the Akron Chamber of Commerce reveal the ever increasing number of tires shipped by American companies to foreign countries and the manner in which overseas trade has come to American factories. While the figures given are those of the entire industry in the United States, a large portion come from Akron, where more than 65 per cent of the tires of the United States and the world are made.

During the 11 months ended May 30 the exports in tires alone amounted to \$14,045,911. This figure is larger than the shipments in 1921, when a total of \$13,422,000 worth of tires was exported, in spite of the lower prices which have obtained during the latter period.

In 1914, the year the war started, the shipments from America amounted to only \$3,943,220, and while during the war period the exports mounted, and continued to mount until 1920, the present year's exports will be as large as in 1918, when \$14,511,000 worth of tires were exported. The peak of tire exports was reached in 1920, when the total amounted to \$43,899,502, while during the year previous shipments amounting to a total of \$28,924,659 were exported.

Tire exports to various countries during the 11 months' period covered by the report are as follows: Belgium, \$46,340; Denmark, \$397,818; France, \$316,161; Norway, \$308,233; Spain, \$279,810; Sweden, \$508,564; England, \$3,753,527; Canada, \$729,466; Mexico, \$898,309; Argentina, \$769,105; Brazil, \$249,712; Venezuela, \$153,329; China, \$67,054; Australia, \$262,816; New Zealand, \$465,580, and British South Africa, \$667,562.

While totals for imports into these countries from foreign sources are not yet available, the total imports of tires into these countries in such terms as they are available and the percentage which came from America prove interesting.

The United Kingdom during 1919 imported £2,653,423 worth of tires, of which 22 per cent came from America. Italy's imports of tires in 1921 amounted to 3,764 quintals, of which America shipped 4 per cent.

The Netherlands in 1921 imported tires to the amount of 2,636,491 guilders (one guilder equals \$0.402 normal), of which America was responsible for 27 per cent. Spain's imports amounted to 615,198 kilos, of which America produced 29 per cent. In 1918 Sweden imported 589,781 kilos of tires, of which the American total amounted to 72 per cent.

Denmark's imports in 1920 amounted to 1,724,000 kilos, of which America produced 22 per cent. Venezuela in 1920 imported 379,783 kilos of tires, of which 47 per cent came from America. Chile in 1920 imported 328,000 kilos, of which 86 per cent originated in America.

Brazil's imports of tires in dollars amounted to 2,841,224 in 1920, of which America's percentage was 64. America's exports of 20,159 tires into India in 1921 amounted to 17 per cent of the total 116,000 imported that year.

OLD INNER TUBES UTILIZED

Collapsible pails, handy articles for camping or automobile trips, can be easily made out of old inner tubes by vulcanizing one end. Another use for inner tubes is as life preservers. Made to just fit beneath the arms they are also useful for timid bathers who are learning to swim.

The Rubber Trade in the Midwest

Midwest Rubber Manufacturers' Association

There was a large attendance at the regular monthly meeting and luncheon of the Midwest Rubber Manufacturers' Association, which was held on August 8 at the Hotel Morrison, Chicago, Illinois. W. W. Wuchter, president of the organization and general manager of The Nebraska Tire & Rubber Co., was the presiding officer.

The recent reduction of tire prices, with its consequent effect upon the industry in general, was the main subject of discussion. In the opinion of many of the members present, the recent tire price cuts were unwarranted, and were having a tendency to cause uncertainty, with a reduction of current sales. Following the luncheon, the chief speaker, J. A. Marvin, of the American Audit Co., Chicago, Illinois, prophesied a decided revival of general business, notwithstanding the various strikes. He believed, however, that in the present condition of business uncertainty, which may last six months, tire manufacturers, as well as other producers, should check up on the situation in order to be thoroughly prepared to meet possible contingencies.

Illinois

William Ogden Hadley, formerly general manager and chief chemist of the Chemical Research Co., Lynn, Massachusetts, has been recently appointed production engineer and chemist for Rubber & Cements, Inc., 3026-3030 South La Salle street, Chicago, Illinois. It is interesting to note that Mr. Hadley's grandfather, the late William W. Hadley, in 1850 originated the manufacture of rubber cement, and that the family, since that time, has been actively engaged in its production. Other executives of Rubber & Cements, Inc., include: Samuel J. Andalman, president; Samuel J. Green, secretary; Sampson Andalman, treasurer, and A. P. Eves, chief chemist.

The Better Tires Co., formerly at 2023-2029 South Michigan avenue, Chicago, Illinois, is now in its new three-story building, at Michigan avenue and 18th street, Chicago, Illinois. The new quarters, occupied exclusively by this company, contain 50,000 square feet of floor space, while the building is conveniently located in the center of Chicago's wholesale tire district.

A contract was recently let for the erection of a modern plant for the Servus Rubber Co., 401-402 Central Trust Building, Rock Island, Illinois, manufacturer of rubber and canvas footwear. The main structure, which will be of brick, 300 by 60 feet, three stories in height, has boiler rooms, storage warehouse and cement house separate. The cost of the whole construction, exclusive of power plant, plumbing, heating, and lighting, will be approximately \$117,000, and it is intended to make this factory one of the most efficiently arranged and well-equipped plants in the country. Executives include: Judson J. Adams, president; Lawrence B. Icely and John T. Crowley, vice-presidents; Irvin S. Rauch, treasurer, and William T. Church, secretary.

Recent additions to the sales force of the Weaver Manufacturing Co., Springfield, Illinois, include Del Lang, who will travel Wisconsin, Minnesota, North and South Dakota, and part of Illinois, while Joseph Pender will assume charge of a territory including Arkansas, Oklahoma, and parts of Louisiana and Texas. The Weaver organization, which includes a factory branch in Canada, specializes in the manufacture of garage and shop equipment. W. T. Kimber is advertising manager.

Indiana

The International Rubber Company of America, Anderson, Indiana, is now making about 600 cord tires a day, but is also increasing its equipment preparatory to producing 1,000 tires a day. Officials of the company, which include J. D. Wiggins, president and general manager, and H. W. Lantz, factory manager, state

that the entire output of the plant has been sold for a period of three years. The Longwear Tire & Rubber Co., Inc., 1731 Broadway, New York, N. Y., is the exclusive sales agent for the International company.

The Burdick Tire & Rubber Co., with executive offices at 10 South La Salle street, Chicago, Illinois, plans to begin operations in the near future at its plant in Noblesville, Indiana, where "Armadillo" cord tires, as well as tubes and accessories, will be manufactured. The plant capacity will be 1,500 casings and approximately 3,000 tubes a day when running at a maximum. H. P. Steinbrenner is secretary and treasurer.

The Pharis Tire & Rubber Co., Newark, Ohio, has recently made a contract with the Lewis-Gross Sales Co., which organization has opened offices at New Castle, Indiana, and will carry the Pharis products, for which there is said to be an increasing demand. Daily production is now 1,000 tires and the same number of inner tubes, while prospects for the future are very encouraging.

Wisconsin

Officials of the Racine Rubber Co., Racine, Wisconsin, state that, following the recent resignation of Russell Y. Cooke as general sales manager, L. M. Van Riper was appointed his successor. Mr. Van Riper was formerly western sales manager for the Ajax Rubber Co., Inc. Other executives of the Racine Rubber Co. include: J. C. Weston, president; L. T. Vance, vice-president and general factory manager, and E. L. Fries, treasurer. The company manufactures bicycle and automobile tires.

A part of the \$300,000 bond issue sold to two New York City and Chicago firms at the time of the recent reorganization of the Racine Horseshoe Tire Co., Racine, Wisconsin, is being used by the latter concern for minor extensions and improvements. James C. Lawrence is president of the company.

Two additional buildings are being erected for the C. A. Shaler Co., Waupun, Wisconsin, manufacturer of vulcanizers, vulcanizing materials and tools. The main structure, in which the company is now manufacturing more vulcanizers a week than ever before in the history of the organization, contains about 30,000 square feet, while one of the buildings, when completed, will supply an additional 7,000 square feet, approximately. By September 1 the enlargements are to be finished, and the new buildings ready for occupancy. C. A. Shaler is president.

Missouri

Officials of the Thermoid Rubber Co., Trenton, New Jersey, announce that arrangements are being completed, and service to the trade will soon be offered at the company's new branch in the Lathrop Building, Tenth and Grand avenues, Kansas City, Missouri, where H. J. Campbell is in charge. The Thermoid organization manufactures brake linings, radiator hose, joints and clutch facings, as well as "Crolide" compound tires.

The Kokomo Rubber Co., Kokomo, Indiana, manufacturer of "Long-Life" tires and tubes, has opened another branch at 2001 Locust street, St. Louis, Missouri, where formerly Kokomo tires were sold by a distributing firm. Walter W. Napier has been appointed manager of the new St. Louis branch, with Wallace E. Acton as office manager.

S. W. Reese, district manager at 1922 Grand avenue, Kansas City, Missouri, of one of the branches of The Star Rubber Co., Akron, Ohio, recently closed eight contracts with tire dealers who will handle Star tires in the states of Colorado, Kansas, Missouri, Louisiana, and Texas.

Midwestern Notes

The Grand Rapids Tire & Rubber Corporation, Grand Rapids, Michigan, has prepared plans and work will begin at once toward the erection of a complete new unit which will cost approximately

\$250,000. This company now has distributors in every important jobbing center in the United States, while employing over six hundred dealers in the state of Michigan alone. The special feature of "Corduroy" cord tires manufactured by this organization is a patented sidewall protection. L. A. Brown is president and general manager of the company.

Officials of The Ardmore-Akron Tire & Rubber Co., Herskowitz Building, Oklahoma City, Oklahoma, announce that J. E. Harris has recently been appointed vice-president in charge of sales. Fox Wood is president and general manager of the organization.

John F. Evans, formerly in charge of the Indianapolis branch of The Miller Rubber Co., Akron, Ohio, has been promoted to the managership of that company's Minneapolis division, which controls the states of Minnesota, Montana, North and South Dakota, and the western part of Wisconsin.

The Rubber Trade on the Pacific Coast

Pacific coast rubber manufacturers have been greatly troubled by the strikes on the transcontinental lines, their chief difficulty being in getting mechanical equipment, cotton fabrics, and compounding ingredients. Luckily the supply of crude rubber shipped directly from the Orient has been ample.

General trade maintains an excellent tone, according to reports from all the large producing and consuming centers, and many large tire factories are closely pressed with orders. A lively demand for mechanical rubber goods of various kinds is reported, and collections are said to be very much better.

Los Angeles

J. T. Spicer, general sales manager of the Thermoid Rubber Co., Trenton, New Jersey, has been a recent visitor in Los Angeles.

A Los Angeles-Honolulu steamship line having been established, efforts are being made to extend trade relations with the Hawaiian Islands, which buy, it is said, \$80,000,000 worth of goods annually. A trade excursion has been arranged for 225 representatives of southern California industries, to start September 9 and allow three weeks' stay on the islands. Many salesmen connected with rubber manufacturing and jobbing concerns will be in the party.

The Samson Tire & Rubber Corporation, Los Angeles, is operating its factory at Compton, California, in three 8-hour shifts to meet an unusual demand for cord tires. According to Adolf Schleicher, president, production activity has been increased in some departments 200 and in others 400 per cent through factory extension and the addition of nearly a quarter of a million dollars' worth of machinery. Plans are being made now for further works expansion and increase in equipment. The company does not supply original equipment, so that its output is absorbed by consumers for replacements on passenger cars and stages. Instead of trying to reduce tire mileage, as some makers advise, Mr. Schleicher says his company is trying to increase it and he points to a gain of 67 per cent in the first five months of 1922 as proof of the wisdom of such policy.

A notable event at the Los Angeles factory of The Goodyear Tire & Rubber Co., July 31, was the graduation of thirty-one members of the Goodyear "flying squadron," each one receiving a diploma as a master rubber worker. These were the last of the 106 squadron men sent from Akron to start operations at the Los Angeles plant. Another squadron is now being selected.

M. J. O'Donnell, president of the Falls Rubber Co., manufacturer of Falls tires and Evergreen tubes, at Cuyahoga Falls, Ohio, visited Los Angeles after making a trade survey in Seattle, Portland and San Francisco. He reports an exceptionally good business for his company's products on the Coast, and that the unfilled orders at the factory were never so large.

H. O. Bock, ten years in the service of the United States Rubber Co., has, after a special study at the company's tire factories in the East, been appointed manager for tire sales for the company's southern California branches, according to J. B. Magee, branch manager.

San Francisco

One of the very busy rubber concerns on the Coast is the Universal Tire & Rubber Co., 938-958 Harrison street, San Francisco. This concern produces a high grade line of hose, belting, tubing, seeders' and printers' rollers, valves, gaskets, diaphragms, plumbers' supplies and other mechanical goods. The plant equipment includes a 66-inch calender with several 40 and 46-inch mills, belt presses, tubing machines, a hose builder of original design, with a capacity of many thousand feet daily, and a belt-building machine which has just been installed. The president is George M. Stevens; vice-president, E. J. F. Phillips; secretary and treasurer, John V. Filippini; directors, Felix Butte and J. L. Moore; sales manager, R. W. Peters, formerly of the Goodrich and Diamond rubber companies.

The National Consolidated Rubber Co. has taken over the Givens Consolidated Rubber Co., the Wearproof Tire Products Co., and the National Tube Manufacturing Co., of San Francisco, and the Le Doux Rubber Co., of Los Angeles and Wilmington. The main factory and offices are at Second and Howard streets, San Francisco, and the officers are: president and general manager, W. H. Booth, formerly with the Gates Rubber Co., and Toliver Tube Co., Denver, and the Givens concern; vice-president, Dr. J. C. Le Doux, of Los Angeles; secretary-treasurer, George A. Le Doux, formerly president of the Le Doux Rubber Co. and patentee of the Le Doux inner sole tire. The new company will make the Le Doux inner sole tire and puncture-proof tube, and the Givens beadless tire. The San Francisco factory has a capacity of about 2,000 tires and tubes daily, but the company also intends to operate a plant in Los Angeles, where not only tires and tubes mentioned will be made but also a complete line of mechanicals and accessories.

According to W. T. Powell, Pacific Coast district manager for The B. F. Goodrich Co., D. A. Lord, five years in service, has been appointed manager of truck tire sales, and E. W. Bernard, ten years in service, has been made manager of pneumatic tire sales at the San Francisco branch.

Samuel Freeman, of The Spreckels "Savage" Tire Co., San Diego, California, has opened a new distributing headquarters in San Francisco at Polk street and Golden Gate avenue. He reports having recently equipped several ice, oil and baking companies with tires for their motor fleets.

One of the new rubber concerns is the Sapp Vulcanizing Air Bag Co., organized in Sacramento, California, with \$25,000 capital to manufacture a recently invented device for tire repair men. The directors are George Sapp, Joseph Rossi, John Brown, and E. J. Hughes.

The Fresno Tire & Rubber Co. is making good progress in building the first unit of its new tire and tube factory at Whitson and Second streets, Selma, California.

Northwestern Notes

With a force of fifty men the Jack Tire & Rubber Co., Spokane, Washington, is making an average of fifty casings and sixty tubes daily, according to T. G. Richards, president and general manager. The company's plant has been working only since March 15, and it has a capacity of 100 tires and 100 tubes a day. Five salesmen are kept on the road covering Washington and Idaho, and the number of dealers handling Jack tires has been increased from 10 to 175.

Good headway is reported by the Columbia Tire Corporation in the construction of its first factory unit at 1749 Albina avenue, Portland, Oregon. The building will cover a ground space 81 by

351 feet and cost \$80,000, exclusive of equipment. The company's officers say that a good volume of business is assured.

It is announced that production, stopped last March, will be resumed actively within a couple of months by the Montana Cord Tire Co., Great Falls, Montana. E. B. Scott, E. Davis and J. Engstrom were recently reelected directors.

Southwestern Notes

The Monkey Grip Rubber Co., Fort Worth, Texas, has acquired all the assets of the Texas Motor Car Association, the Southland Tire & Rubber Co., and the Moco Company of America, Oklahoma City, Oklahoma. The concern as now organized has a capitalization of \$1,500,000. The manufacture of "Monkey Grip" tire patches will be continued, while it is planned to produce cord tires and tubes. Officers of the new organization include: Dorset Carter, president; Rudy Copeland, vice-president; W. A. Miller, treasurer; W. H. Sparger, secretary; and R. C. Webber, sales manager.

The reports of a probable shortage in the world supply of cotton are having a marked influence on the owners of plantations in the Southwest supplying the long staple cotton required for tire cord and builder fabric. Many cotton raisers who have not borrowed on their prospective crops declare their intention to hold out for the top market price.

A valuable aid has been the Arizona Pima Cotton Growers' Association, which has just completed its first year's existence. It is affiliated with the American Cotton Growers' Exchange, the national overhead organization, and has handled the lint cotton and seed of members in such a way as to get a much higher price average. It is understood that the national organization is encouraging growers of cotton in California and Lower California to form an association on the Arizona plan.

Weather conditions have been exceptionally favorable for a big cotton crop in both Arizona and California this season, and help is plentiful. What is said to be the largest cotton plantation in the world, that of the Colorado River Land Co., comprising over 100,000 acres below the Mexican border, has, with only a slight increase in planted area, a 50 per cent better crop this year than in 1921, according to H. H. Clark, general manager. It is estimated that it will yield 75,000 of the 85,000 bales expected from Lower California this year. Ginning facilities now afford Calexico and Mexicali, at either side of the international line, a capacity of over 1,000 bales a day. A special cleaning process will add at least one extra grade of cotton to every bale put through the plants.

Bids of 22 cents a pound for big lots of short staple have been refused, the growers generally believing that a price close to 25 cents can be had if they hold out for it.

CANADIAN NOTES

The Premier Tire & Rubber Co., Limited, has removed to 116 Adelaide street West, Toronto, Ontario, Canada, where commodious offices and a complete warehouse and shipping department will facilitate the growing business of this concern. Standard inner tubes of different grades are produced at the company's factory at Beamsville, near Hamilton, Ontario, while the firm is also the exclusive distributor of Seiberling cord tires in the province of Ontario. In addition various accessories are also carried. The officers of the Premier organization include: C. R. Harlock, president; A. C. Secor, vice-president; William Child, secretary-treasurer, and S. B. Trainer, general manager.

"PNEUMATIC TIRES," BY HENRY C. PEARSON, IS NOW READY for distribution. This authoritative, comprehensive work fills a long felt want in the tire industry. It is written for tire manufacturers, dealers and repairmen.

Tire Price Reductions

Following the announcement by The B. F. Goodrich Co. on July 20 of a 10 per cent reduction on cord casings and 15 per cent on fabric tires, other leading manufacturers of the industry soon fell into line. In the August issue of THE INDIA RUBBER WORLD some of these reductions were mentioned, and new prices quoted. A summary of these various changes also recently appeared in *Tires*.

As briefly quoted from that publication, the most important of the new reductions are: a cut of approximately 15 per cent on Usco, Chain and Nobby straightside fabric tires, as produced by the United States Tire Co., with a 5 per cent drop in the clincher fabric lines, while cord casings were cut 10 per cent.

The Fisk Rubber Co. announced an approximately 10 per cent decrease in cord casing prices and a 7 per cent drop in the Red Top fabric line. While tube prices remain as before, there is an increase of 25 cents per casing on non-skid fabric tires.

Goodyear reductions average 7 per cent on clincher fabric casings, 10 per cent on cords and 15 per cent on straightside fabric tires. A decrease in prices is noted for the All-Weather and Cross-Rib tires, while tube prices remain unchanged.

Simultaneously with the Goodyear announcement came new prices for the Firestone products, averaging 10 per cent reduction for cord tires, with the exception of the oversize 30 by 3½ clincher cord, which was cut 15 per cent, from a list of \$17.50 to \$14.65.

Important reductions made by The Mason Tire & Rubber Co. are an approximately 22 per cent decrease in the Maxi-Mile fabric line, while the prices for cord tires show an average decline of 23 per cent. The Heavy Duty 30 by 3½ Maxi-Mile clincher cord is an exception, the new price of \$13.95 being 25 per cent lower than the former list of \$18.75. Tube price reductions range from 6 to 19 per cent.

Noteworthy changes have also been made by the Pennsylvania, Hewitt, Ajax, Miller, Lee, Kenyon, Erie and Amazon companies. The Kelly-Springfield Tire Co. and The General Tire & Rubber Co. have announced no reductions, although it is expected that a new consumer list, as prepared by the latter company, will soon be forthcoming. Conspicuous as an exception to the tendency toward price reduction is the action of The American Rubber & Tire Co. in increasing the price of its casings, particularly cord tires.

In general, a comparison of prices for the last 11 years, with Goodrich prices as a basis, shows that cord casings and tubes are lower than at any time in more than a decade. Cord tire prices are 47.4 per cent lower than the peak prices of March, 1920, while tube prices are 42.2 per cent below the highest point reached in the same month and year. With the exception of the decline in prices in February, 1915, fabric tires now cost less than at any time in the last 11 years.

CANADIAN EXPORTS AND IMPORTS OF RUBBER GOODS

It is interesting to note the surprising development of rubber manufacture in the Dominion of Canada.

In the calendar year 1913, exports of rubber goods from Canada were only \$626,035, compared with \$13,070,124 in 1920. The decline in 1921 to \$3,781,975 indicates a figure still six times greater than for 1913. The value of rubber imported into Canada for the calendar years 1913, 1920 and 1921 is estimated at \$10,114,660, \$19,937,289, and \$7,638,062, respectively. Statistics for the calendar year 1919 show the amount of capital invested in the rubber industry to have been \$42,787,594, while the value of the products is estimated at \$56,003,434. Canada, during the first five months of the present year, ranked second among the countries of the world as a purchaser of our rubber manufactures, with the single exception of the month of February, when she was barely outstripped by Mexico, who bought from the United States rubber goods valued at \$220,425.

Activities of The Rubber Association of America

August Meetings Omitted

IN accordance with the usual custom all division and committee meetings were omitted during August, but plans now under way promise a very busy fall and winter for the association.

September Outing Proposed

For years it was the custom of The Rubber Association to hold an annual summer outing. However, early this summer it appeared improbable that much interest would be manifested in a July or August outing, and the matter was held in abeyance.

The Outing Committee desires to know the sentiment of the members as to an outing late in September, just prior to the beginning of the fall activity of the association, when a general gathering to renew acquaintances and to exchange views and experiences would help to accelerate the association work during the coming year.

The Outing Committee believes that the Seaview Golf Club, Absecon, New Jersey, the scene of the 1919 outing, cannot be equalled as a place at which to hold an affair of the sort contemplated. Here arrangements can be made for exclusive use of the club's facilities which would be impossible at any of the clubs closer to New York. Furthermore, at Seaview there are several tennis courts, provision for trap shooting, a splendid sea-water bathing pool and other accommodations which will insure a good time. A prompt expression from members is requested from the Outing Committee.

Foreign Promotion of Straightside Tires

Responses received from foreign automobile and tire distributors and dealers throughout the world, to the association's educational pamphlet, entitled "Why Straight Side Tires Are Better," which tells the advantages of the straightside over the clincher type, have been very gratifying, and indicate a decided trend toward the straightside type. The Dutch language edition of the booklet has been received from the printer and is being distributed to automobile and tire dealers throughout the Netherlands, Dutch East Indies, Dutch West Indies, Dutch Guiana, etc. The Danish edition is in the course of preparation and should be ready for distribution within the next few weeks.

Questionnaire—First Half of 1922

The responses to the association's questionnaire for the first half of 1922 equal those for previous periods, and it is expected that the report of totals will be ready for distribution within the next two weeks. The report will contain the following data:

Average daily number of employees in the industry during the third week of January, 1922.

Amount of reclaimed rubber produced during the first half of the year. Amount of scrap rubber consumed in the production of reclaimed.

Amount of crude rubber used in the manufacture of all classes of rubber goods during the first six months, and the sales value of shipments of finished articles for the same period.

Inventory of crude rubber in the United States and amount of crude rubber afloat for United States ports, as of June 30, 1922.

UNITED STATES RUBBER EXPORTS AND IMPORTS INCREASE

Reports from the Department of Commerce, Washington, D. C., show substantial increase in crude rubber imports for June, the total figure of approximately 52,000,000 pounds, valued at \$7,600,000, being considerably larger than that for the month preceding, mentioned as 37,000,000 pounds, and valued at \$5,600,000. June figures were also greatly in excess of those for the same month of last year, when crude rubber imports amounted to 35,000,000 pounds, valued at approximately \$6,000,000. These increases are undoubtedly due to the activity of tire manufacturers, many of whom are now operating at nearly peak capacity.

United States exports of rubber goods are maintaining the satisfactory level established in March of this year, and carried through the three months following, the exports for June of this year being nearly twice as great as for June, 1921.

For the fiscal year ended June 30, 1922, \$31,000,000 worth of manufactured rubber goods was exported from the United States, as compared with approximately \$60,000,000 for the fiscal year ended June 30, 1921. When it is considered that prices during the fiscal year 1921-22 were approximately one half of those obtaining during 1920-21, these values are favorable.

Report of Inventory—Production—Domestic Shipments of Pneumatic Casings—Inner Tubes—Solid Tires, Etc.

MONTH	PNEUMATIC CASINGS				INNER TUBES				SOLID TIRES			
	No. Mfrs. Reporting	Inventory	Production	Shipments	No. Mfrs. Reporting	Inventory	Production	Shipments	No. Mfrs. Reporting	Inventory	Production	Shipments
July, 1921	63	3,892,037	2,570,524	2,757,581	61	3,122,815	3,020,981	3,603,248	11	220,003	35,123	55,678
August, 1921	66	3,934,853	3,043,187	2,894,442	64	3,649,319	4,430,152	3,804,060	11	216,367	55,694	66,866
September, 1921	63	3,340,798	1,929,268	2,047,929	62	3,827,830	3,274,822	2,645,758	11	161,832	37,441	50,276
October, 1921	64	3,545,030	1,928,271	1,675,169	64	4,732,016	2,843,918	2,016,371	10	163,299	46,274	45,911
November, 1921	64	3,908,342	1,756,555	1,342,519	63	5,203,568	2,126,211	1,540,299	10	173,451	43,537	34,556
December, 1921	64	3,696,519	1,839,738	1,980,264	54	4,731,021	2,070,098	2,522,710	10	168,515	40,478	39,520
January, 1922	66	4,174,216	2,055,134	1,596,806	66	5,246,647	2,343,393	1,889,724	11	181,769	40,224	33,294
February, 1922	66	4,691,329	2,084,308	1,562,365	65	6,141,956	2,596,774	1,702,583	11	183,448	39,492	36,805
March, 1922	63	5,183,286	2,645,790	2,073,963	63	6,991,118	3,017,511	2,090,737	11	182,197	49,433	48,350
April, 1922	65	5,464,336	2,401,187	2,086,651	65	7,230,096	2,650,573	2,329,343	11	173,748	46,664	52,309
May, 1922	65	5,523,095	2,721,503	2,639,273	65	7,189,552	2,970,696	2,938,947	11	170,904	57,640	60,711
June, 1922	64	5,042,147	2,838,890	3,133,260	64	6,186,534	3,130,629	3,973,679	11	169,808	66,089	63,408

"Production" and "Shipment" figures cover the entire month for which each report is made. "Inventory" is reported as of the last day of each month.

"Inventory" includes tires and tubes constituting domestic stock in factory and in transit to, or at, warehouses, branches (if any), or in possession of dealers on consignment basis, and as a total represents all tires and tubes still owned by manufacturers as a domestic stock.

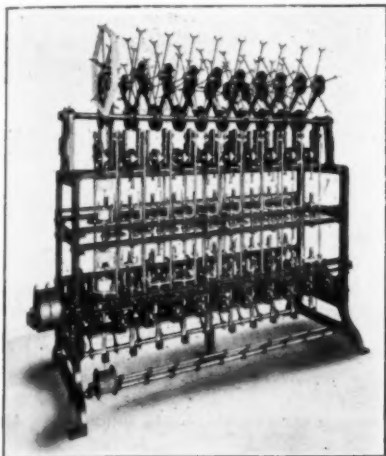
"Shipments" includes only stock forwarded to a purchaser and does not include stock forwarded to a warehouse, branch, or on a consignment basis, or abroad.

Compiled by The Rubber Association of America, Inc.

Covering Rubber Thread

By John L. Alden¹

Covered rubber is an important item in the manufacture of many elastic fabrics. The function of the cotton cover is to preserve the wearing qualities of the rubber and to protect it from air and dampness. The cover is ordinarily composed of a single



Rubber Thread Covering Machine

or double wrapping of cotton yarn, the double cover always being applied in opposite directions. During the covering process the rubber thread is stretched almost to the breaking point. The cotton is wound on the rubber with wide spacing, while the thread is in the stretched condition. When the tension is released the rubber relaxes until the strands of yarn lie side by side in

a smooth cover. The amount of collapse from the stretched length to the relaxed length then becomes the stretch of the finished cord. Manufacturers' requirements for covered rubber thread are mainly a predetermined stretch, a smooth and regular cover, and a cord without a tendency to kink or twist. Owing to the demand for covered rubber thread a small high-speed insulating machine has been adapted to the purpose of thread covering. The processes of insulating and rubber covering are almost identical, and to make the new product required the addition of no untried features to a machine which has been in successful operation for a number of years.

To avoid imperfect covering due to irregularly driven spindles, all of the machine parts that affect the quality of the covered rubber are gear driven. There is a positive relation between the flyer speed and the pull-out speed, making it impossible to produce bad work because of slipping bands. Each spindle is a separate machine provided with its own change gears and cone clutch for starting and stopping. This is an important advantage since the stretch and quality of rubber can be varied on each spindle.

The inner cover of cotton is applied by the lower deck of spindles, the speed of which is 4,000 r.p.m. The speed of the upper deck flyers may be changed through gearing to suit the character of the work; from 2,000 to 3,000 r.p.m. is the usual speed of the upper flyers on ordinary work. Those familiar with this class of machinery will recognize these as being extraordinarily high speeds. Extreme care in the details of design and workmanship is necessary to attain such speeds. All gearing must be carefully cut. The hollow spindles are ground and run in specially designed bearings. The aluminum flyers and other high-speed revolving parts must be accurately balanced.

The inverted flyer is permanently attached to the spindle, allowing the tube of yarn to be slipped off without disturbing any spindle parts. It is customary to employ yarn wound in cheese form on paper tubes. This tube is forced over the knives of the molded Bakelite tube carrier which turns freely on the spindle. It has been found that this combination is in better balance than the old-fashioned wooden bobbin.

A spare cheese of yarn is carried above each spindle on the stationary tube. When the tube on the flyer is exhausted it is cut off the tube carrier and the reserve tube slipped down in its place. By thus avoiding the necessity for cutting the rubber, the number of knots is reduced. For most work sufficient yarn is provided on the flyer and on the storage tube to allow a full day's run without cutting the rubber.

The illustration shows this machine arranged for reeling skeins of finished rubber. This is the arrangement most acceptable to knitters of surgical goods since it is necessary to handle the material in skeins for shrinking. Webbing mills and other weavers generally prefer the rubber wound on spools. In this case an accurate traverse motion is provided which holds the well laid spool.

The machine is ordinarily built as a double machine with ten spindles on a side. The floor space is very small, being but 7 feet, 10 inches by 2 feet, 10 inches. Owing to the high speed, and with the individual spindle control, very high production is maintained at all times. On the ordinary run of work from 150 to 200 yards of finished rubber are taken off per spindle hour.

RUBBER THREAD EXPORTS GROWING

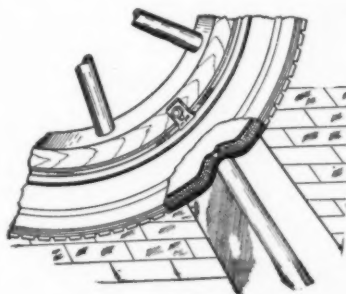
A study of recent statistics reveals interesting figures relating to exports of rubber thread from the United States. During the month of March England bought from us rubber thread valued at \$77,586, while she has kept the lead during the first five months of 1922 in the purchase of this product, with the exception of February, when France, ordinarily the second largest customer, outstripped her, buying goods valued at \$29,122. The next most important purchaser has been Japan, who has kept third place throughout the period mentioned, her largest order being in January, with goods valued at \$18,300.

Other countries that should be mentioned include Switzerland, with purchases in February and March at \$3,658 and \$5,079, respectively. Belgium, Brazil, and Quebec and Ontario have also taken considerable amounts.

Rubber thread forms a most important item in the manufacture of golf balls and elastic fabrics.

STONE BRUISE MAY CAUSE SERIOUS TIRE INJURY

An automobile tire striking a stone or curb is often more seriously damaged than at first supposed, and the injury to the tire fabric, though unseen at length results in a blowout, due to the successive breaking of the fabric plies.



One Cause of Blowouts

The inside ply, which is the shortest, because of the curvature of the tire, gives way first, as a result of the undue stretching, and the broken edges of the fabric sometimes wear a hole in the inner tube at that point. If the tube is chafed through

or cut after a bruise, such as described, the air will pass directly through the carcass and force the rubber side covering, and sometimes the tread, loose from the fabric. Such a final breaking down of the tire is seldom the result of a defect in manufacture. —United States Tire Co., News Service Bureau.

¹Mechanical Engineer, American Insulating Machinery Co., Philadelphia, Pennsylvania.

"Rubber Machinery," by Henry C. Pearson, should be in the library of every rubber company.

Foreign Tariffs Japan

The Japanese import tariff is equal for all countries, except in only a few cases, where a lower Conventional Tariff is granted. Among the countries receiving these lesser rates are: France, The United Kingdom, The United States, Italy, Canada, and Belgium.

It should be noted that ad valorem duties are levied according to the value of goods at the time of their arrival at the port of importation. Customs duties are collected from the person making the import application. The Japanese monetary unit is the yen, equal to \$0.4975 at normal exchange, actual exchange variable. The kin is the unit of quantity, and is equal to 1.32275 pounds.

Tariff No.	Articles	General Duty
143	Crude india rubber, crude gutta percha, and substitutes thereof.....	Free
319	Waterproof tissues coated or inserted with india rubber:	
	1. Wholly or partly of silk.....	40% ad valorem
	2. Other.....	57.40 yen per 100 kin
320	Elastic webbing and elastic cords, elastic braids, or the like:	
	1. Exceeding 8 centimeters in width:	
	A. Partly of silk.....	148.00 yen per 100 kin
	B. Other.....	86.00 yen per 100 kin
	2. Other:	
	A. Woven:	
	a. Partly of silk.....	40% ad valorem
	b. Other.....	30% ad valorem
	B. Other:	
	a. Partly of silk.....	40% ad valorem
	b. Other.....	30% ad valorem
321	Insulating tapes or tissues.....	19.60 yen per 100 kin
335	Air cushions:	
	1. Wholly or partly of silk.....	315.00 yen per 100 kin
	2. Other.....	124.00 yen per 100 kin
344	Raincoats:	
	1. Wholly or partly of silk.....	50% ad valorem
	2. Other.....	136.00 yen per 100 kin
347	Gloves:	
	3. Other than leather, silk, cotton, flax, or wool.....	40% ad valorem
351	Trouser suspenders or braces:	
	1. Wholly or partly of silk.....	454.00 yen per 100 kin
	2. Other.....	102.00 yen per 100 kin
352	Belts, other than leather or silk.....	40% ad valorem
353	Sleeve bands, garters, and the like:	
	1. Wholly or partly of silk.....	50% ad valorem
	2. Other.....	178.00 yen per 100 kin
355	Boots, shoes, slippers, sandals, clogs, and the like:	
	1. Boots:	
	B. Of india rubber.....	50.00 yen per 100 kin
	2. Shoes:	
	B. Of canvas or duck:	
	b. Other than with leather sole....	57.80 yen per 100 kin
	D. Other than of leather, silk, canvas, or duck.....	40% ad valorem
486	Over-shoes of india rubber.....	51.60 yen per 100 kin
	Insulated electric wires:	
	1. Armored with metals:	
	A. Submarine telegraphic or telephonic cables.....	Free
	B. Other:	
	a. Combined with india rubber or gutta percha.....	11.00 yen per 100 kin
	2. Other:	
	A. Flexible cords:	
	a. Combined with silk.....	25% ad valorem
	b. Other.....	18.00 yen per 100 kin
	B. Other:	
	a. Combined with india rubber or gutta percha.....	11.50 yen per 100 kin
564	Parts of automobiles, excluding motive machinery: (Including tires and tubes).....	30% ad valorem general tariff 25% ad valorem conventional tariff
566	Parts of cycles, excluding motive machinery:	
	1. Tires.....	114.00 yen per 100 kin
567	Vehicles and parts thereof, not otherwise provided for. (Including tires).....	40% ad valorem
590	Diving apparatus and parts thereof:	
	1. Diving dresses.....	15.00 yen each.
	2. Other.....	20% ad valorem
629	Manufactures of india rubber or gutta percha, not otherwise provided for:	
	4. India rubber solution.....	18.10 yen per 100 kin, including receptacles
	2. India rubber paste, reclaimed india rubber and other unvulcanized india rubber.....	20% ad valorem
	3. Dental rubbers.....	75.80 yen per 100 kin
	4. Other:	
	A. Soft:	
	A-1. In lumps.....	20% ad valorem
	A-2. Rods and cords:	
	a. Combined with metal, fabrics, yarns, threads, cords or fibers.....	8.65 yen per 100 kin
	b. Other.....	20% ad valorem
	A-3. Plates and sheets:	
	a. Combined with metal, fabrics, yarns, threads, cords or fibers.....	

Tariff No.	Articles	General Duty
	b. Other:	7.40 yen per 100 kin
	b-1. Not exceeding 1 millimeter in thickness.....	95.60 yen per 100 kin
	b-2. Other.....	50.30 yen per 100 kin
629	Manufactures of india rubber or gutta percha, not otherwise provided for (continued):	
	A-4. Tubes:	
	a. Armored with metal, inside or outside.....	15.30 yen per 100 kin
	b. Other:	
	b-1. Combined with fabrics, yarns, threads, cords or fibers, or with metal insertion.....	13.80 yen per 100 kin
	b-2. Other.....	93.20 yen per 100 kin
	A-5. Belts and belting for machinery.....	22.20 yen per 100 kin
	A-6. Threads, strips, bands, rings and washers:	
	a. Combined with metal, fabrics, yarns, threads, cords or fibers.....	15.30 yen per 100 kin
	b. Other.....	55.60 yen per 100 kin
	A-7. Erasers.....	24.90 yen per 100 kin
	A-8. Water bottles.....	48.50 yen per 100 kin
	A-9. Nipples.....	132.00 yen per 100 kin including inner packings
	A-10. Mats and matting.....	30% ad valorem
	A-11. Other.....	40% ad valorem
	B. Other:	
	B-1. In lumps, bars or rods, plates and sheets.....	35.40 yen per 100 kin
	B-2. Tubes.....	38.90 yen per 100 kin
	B-3. Rings and washers.....	43.70 yen per 100 kin
	B-4. Combs.....	157.00 yen per 100 kin including inner packings
	B-5. Other.....	40% ad valorem
630	Waste or old india rubber and gutta percha, fit only for remanufacturing.....	Free
631	Hard fibers (rods, plates, sheets, tubes, etc.).....	11.40 yen per 100 kin
640	Articles for billiards, tennis, cricket, chess and other games, and accessories thereof.....	50% ad valorem
641	Toys.....	50% ad valorem

Norway

New customs duties, effective July 3, have been levied in Norway on various articles, classed as luxuries. Among these increased rates, which are said to be only temporary, appear the following:

No. in Customs Tariff	Articles	Former Duty (Minimum Tariff) Kr. Per Kilog.	New Duty Per Cent Ad Val.
	Ribbons and belts made of ribbons, of all kinds, interwoven or not with elastic, gutta percha and the like:		
84	Of silk or of silk with interwoven metal threads.....	20 00	25
85	Of mixed silk.....	10 00	25
	Clothing and made-up articles of tissues, not otherwise provided for:		
	Impregnated or coated with oil, varnish, rubber or the like, or made of such material, or with a covering of celluloid:		
314	Of material wholly or partly of silk.....	6 00	25
315	Of material wholly or partly of wool.....	2 60	10

Spain—France

As the result of a new treaty, arranged between France and Spain, certain preferential customs rates will be in force in the two countries, effective for a year and beginning July 15. Among the various items listed were the following:

Tariff No.	Articles	Present "Second Column" Rate of Duty Pes. Cts.	Duty Fixed by the Convention Pes. Cts.
	Rubber, gutta percha, etc.:		
1497	Transmission belts, disks and valves, with or without ironwork.....	4 00	3 50
1498	Solid tires.....	3 50	2 25
1499	Tires with metal rims.....	2 40	2 00
1500	Inner tubes.....	8 00	5 50
1501	Outer covers.....	6 00	4 00
1502	Articles of rubber for hygiene.....	8 00	6 00
1503	Combs, hairpins and hatpins.....	6 60	5 00
1504	Footwear, soles and heels.....	5 00	4 00
1505	Dress preservers.....	8 00	7 00
1506	Articles of rubber not specially mentioned.....	7 00	6 00
	Fabrics impregnated with rubber, weighing per square metre:		
1509	More than 800 grams.....	7 50	7 00
1510	From 400 to 800 grams.....	6 50	6 00
1511	Less than 400 grams.....	5 50	5 00
1512	Elastic fabrics for boots and shoes.....	7 50	7 00
1513	Elastic bands with admixture of textile fibers, for braces, garters, etc.....	8 00	7 00
1514	Garters and braces, made-up.....	10 06	8 50
1515	Waterproof fabrics, made-up.....	12 00	10 00
1516	Waxed cloth.....	0 60	0 50
	Games of:		
1525	Rubber.....	8 00	7 00

The Rubber Industry in Great Britain

By Our Regular Correspondent

Proposed American Tariff Protested

A VIGOROUS protest has been made by the India Rubber Manufacturers' Association against the proposed American tariff on rubber goods exported from the United Kingdom to the United States. In view of the fact that about 70 per cent of the raw rubber production of the world is consumed by the United States and Canada, the association thinks it is difficult to prove the necessity for protection against the United Kingdom manufacturers who consume only 12 per cent of the world's supplies.

It is pointed out that in respect to the bulk of goods other than sports goods the United States manufacturers are subject to little British competition. With regard to sports goods it is recognized that the British have a pull owing to the high degree of perfection attained by the home work people, and American competition is not to be feared in the immediate future. The American consumer, therefore, is likely to be prejudiced considerably if the proposed ad valorem duty of 45 per cent is imposed.

The association carries the matter farther by pointing out that the money this country borrowed from the United States during the war was lent to our Allies. The British Government proposition to pay interest on this debt to the tune of forty or fifty millions sterling yearly can be carried out only by means of British goods and services.

Better Business in Most Lines

Things seem to be improving in most departments, while in the waterproofing branch there has been quite a boom. From the ordinary person's point of view the summer, since the middle of June, has been a failure, owing to cold unsettled weather with a good deal of rain. The waterproofers have not grumbled, however.

Ebonite Gramophone Horns

Hearing one of these horns recently in the inventor's workshops in London indicated that they are superior to the more common metal ones. It seems strange that this material has not been used before, but apparently it has remained for Mr. Collier to demonstrate its utility in this direction. Provisional protection for a patent has been obtained, No. 774, July 1, 1921, and a syndicate is being formed to acquire and work the patents. A contract has been entered into with a well-known British ebonite manufacturer to make the horns at a price which will enable them to be sold to the public at an ample margin of profit. Although the horns can be made the usual jet black, they are also being produced white or in brilliant colors and are being supplied with the usual fittings for external use by the Collier Ebonite Horn Co., 57-58 Chancery Lane, London W.C.

Sir Samuel Turner, Asbestos King

The following remarks on a British asbestos king are taken from "Northern Lights," published in a North of England newspaper:

"Sir Samuel Turner, of Rochdale, is the man who put the best in asbestos. His fame is far-flung and fireproof, for he is known everywhere as the Asbestos King. He didn't begin that way. There wasn't any asbestos when he was born 80-odd years ago. His father, who founded the cotton spinning business in Rochdale, made him a mechanical engineer. Nature made him inventive. In 1870 he patented a packing for steam engines which developed into a big business. In 1878 asbestos was discovered and Sir Samuel was first to spot its commercial possibilities. He invented a method of producing a packing which no heat could affect and reaped a rich reward before the others found out his

secret. Even now Turner Bros., Rochdale, Trafford Park, Manchester, are among the largest world suppliers. He has been a generous benefactor to his native town."

New Rubber Research Laboratories

The new laboratories of the Research Association of British Rubber and Tyre Manufacturers at Lansdowne Road, Croydon, near London, were opened by Lord Colwyn, chairman of Chas. Macintosh & Co., Limited, on July 26. The opening ceremony, which was largely attended, was preceded by a luncheon given to members of the press, the board of management, and distinguished guests.

In inviting the cooperation of the press in making the public better acquainted with the many uses of rubber, the chairman, Alexander Johnston, emphasized the fact that though the number of manufacturers is small the users of rubber are manifold. Many look upon the coming ten years as the "Age of Rubber." The great progress made by America in its manufacture is due to economic factors, such as high wages and therefore greater spending power, and not to any lack of enterprise by British manufacturers. We could not emulate America unless economic facts take a different turn. There are in America many classes of rubber goods of which we have no knowledge whatever. With regard to the depression in trade, he said that we are certain of our future and that the present bad phase will pass.

Sir Frank Heath, secretary of the Department of Scientific and Industrial Research, congratulated the rubber industry (as one of the twenty-four which are obtaining government assistance) on having obtained a firm promise that the financial help will not be withheld during any financial crisis the country may pass through. They heard a good deal about insurance against losses of all kinds, but scientific research was an insurance against ignorance.

The toast was responded to by H. Massac Buist of the *Morning Post*, Herbert Standring of the *Rubber Age*, who can claim to be the oldest rubber journalist, and Mr. Holland, of the technical press. The last-named speaker said research is all very well in its way and may help on the industry, but at the present moment it would do the trade a lot more good to put an embargo on American tires. A great fuss, he said, is being made about German fabric gloves, which he had never previously heard of, and he felt that far more fabric was coming into the country in American tires.

At the opening ceremony Alexander Johnston eulogized the merits of Lord Colwyn as a man of affairs and referred to the occasion as an epoch-making event. The general aspect of the rubber industry is one of outstanding importance, though it may still be only in its childhood, but it is interesting to note that the value of the world's rubber goods made in 1920 was 350 millions sterling, and the rubber trade is one of the established industries of the world. He thought that perhaps now the firms who had not joined in the scheme would apply for membership.

With regard to the work of the laboratories it had been decided, after full consideration, that only the problems of manufacture could be tackled and no work on the plantation side would be undertaken. Lord Colwyn said that adversity is the best training for business and both sides of the industry are suffering. He was not so confident about the planting industry, as of the manufacturing, and did not know what is going to happen to the plantations. America is very keen, but he hoped that she would not be able to buy up the present proprietors at slump prices. There is, however, no reason for despair. Intrepidity,

courage and tenacity will pull the industry through its troubles. The present position centers on brains and these laboratories will enable this country to face other countries on equal terms. Germany, he went on to say, has the money to develop her industries, while our industries are seriously hampered by high taxation.

The visitors were afterwards conducted on a tour of the premises, which consists of two dwelling houses adapted for the purposes required, and additional premises newly erected between them. Up to the present the work has been carried on at University College, London, under the directorship of D. B. Porritt, late of the North British Rubber Co., Limited, the committee of management consisting of Alexander Johnston, chairman; P. A. Birley; O. W. H. Briggs; J. H. Brooking; Lieutenant Colonel J. Sealey-Clarke; E. Healey; F. W. Hinde; J. H. Mandleberg; A. S. Morrison; Stuart A. Russell; J. Traxler and Dr. D. F. Twiss.

The annual government grant is £5,000, conditional on at least a similar sum being raised by the industry itself. After five years the grant may be withdrawn. It is understood that all bona fide manufacturers are eligible for membership at a subscription based upon their respective capitals, the maximum being £1,000 and the minimum £50. So far it appears that only fifteen firms have joined, and though these include many prominent firms there is more than one notable firm still electing to remain out in the cold. The present membership comprises the following:

The Avon India Rubber Co., Limited; W. & A. Bates, Limited; The Dunlop Rubber Co., Limited; The Harboro Rubber Co., Limited; Henley's Tyre & Rubber Co., Limited; The India Rubber and Gutta Percha Telegraph Works Co., Limited; The Leyland & Birmingham Rubber Co., Limited; Chas. Macintosh & Co., Limited; J. Mandleberg & Co., Limited; The North British Rubber Co., Limited; Redfern's Rubber Works, Limited; St. Helen's Cable & Rubber Co., Limited; George Spencer-Moulton Co., Limited; Werneth Rubber Works, Limited; Wood-Milne, Limited.

A conspicuous feature, the carpeting throughout of the premises with rubber, may be mentioned. The hall was done by the Leyland & Birmingham Rubber Co., Limited; "Macruco" tiling, manufactured by Chas. Macintosh & Co., Limited, is to be seen in the director's private office, while the carpet in the general office is the work of the St. Helen's Cable and Rubber Co., Limited. Elsewhere the material mostly used is the "Paraflor" rubber flooring of the North British Rubber Co., Limited.

The Rubber Trade in Germany

By Our Regular Correspondent

The topic of the day is the sensational fall of the mark. During the conference at Genoa optimists expected the mark to rise but pessimists darkly foretold a sudden and unequalled depreciation which would practically spell bankruptcy for Germany and put her, as far as the value of the mark was concerned, in the same position as Austria and Poland. Recent events seem to justify the worst prophecies.

Some time ago it was reported in these columns that there were evidences of a break in the industrial boom; orders had been cancelled and buyers were beginning to hold off in hopes of a fall in the steadily mounting prices. Manufacturers, too, did not hurry to replenish stocks of raw material.

Now, however, the unprecedented depreciation of the mark has brought about a serious situation. Buyers suddenly began to send in orders as in the height of the recent boom; a shortage of goods resulted; manufacturers rushed to cover their needs in raw materials at greatly enhanced figures. As a result, prices are soaring with renewed vigor.

Asbestos goods are now 400 per cent higher than in July, 1921.

Casings have risen by 25 to 30 per cent within the last few days; the increase in seamless surgical goods brings the price 500 to 550 per cent higher; other surgical goods, 350 per cent higher, and bathing caps, tobacco pouches, sponge bags 300 per cent. Technical goods have again risen 30-40 per cent.

In spite of the fact that crude rubber has again fallen on the English and other foreign markets, here crude rubber rises day by day. In April, 1922, hard fine Pará cost 130 marks per kilo; after various ups and downs, the price fell to 115 marks on June 6, only to make a sudden spurt during the succeeding weeks and reached 170 marks on June 31. Two weeks later, July 15, hard fine Pará brought from 275 to 300 marks per kilo. On the same dates, first latex crêpe stood at 110 marks, fell to 95 marks, rose again to 150 marks and on July 15 was quoted at 205 to 215 marks per kilo, while ribbed smoked sheets were obtainable at practically the same prices.

No wonder that rubber men here are getting nervous.

In connection with the greatly depreciated value of the mark, the local press is pointing out that firms in making up their balance sheets and the government in its statistics have not taken into account the change in the value of the mark. As a result, such statements are entirely misleading so far as value is concerned.

New Goods

A new disinfecting syringe has been patented by Egbert Böhm, Hamburg. It is in the shape of a pencil and can be used as such. The top and bottom can be unscrewed and the medicament is to be put in the upper part.

A subscriber of the *Gummi-Zeitung* relates that in making rubber dolls, bronze molds were used. The articles came out quite black, the after-treatment was very costly and the molds seem to have been affected, too.

Waste from tires, sheet rubber, and rubberized material, finds a market here for the manufacture of heels and soles on a small scale. Up to 10 marks per kilo is paid for usable waste. Scraps left over in the manufacture of raincoats are bought up for use in repairing and the larger pieces do nicely for making bathing caps, sponge bags, and the like.

The newest kind of playing ball says quite distinctly "He, bon jour," when it is squeezed. This seems to be in imitation of a French sample which, when squeezed, showed a tiny devil that shouted lustily, "He, bon jour!"

SIXTH INTERNATIONAL RUBBER EXHIBITION

One of the important features of the Fifth Commercial Fair of Brussels, which will be held in Brussels, Belgium, in April, 1924, will be the Sixth International Exhibition of Rubber, Other Tropical Products and Allied Industries. This exhibition, although running concurrently with the Brussels Fair, will be held in a separate building and will be controlled by the same management as in 1921, the following being directors: H. Greville Montgomery, Hugh C. Montgomery, and Edith A. Browne, overseas delegate. Offices are at 43 Essex street, Strand, W. C. 2, London, England.

ARCHAN FIBER

Sir Henry Wickham, pioneer of the rubber planting industry, during his explorations in South America discovered a fiber which compares favorably with hemp and flax. Known as Arghan, and derived from the ribbon-like leaves of a sedge indigenous to certain parts of South America, it is reported by fiber experts of the Malayan Government to have a tensile strength three times that of silk, while the breaking strain gave results superior to those of staple textile fibers of all classes. Cultivation is now progressing on 50,000 acres granted by the Federated Malay States.

The Rubber Trade in the Far East

By Our Own Correspondent

Ceylon

SEVERAL estates are taking up seriously the question of budding rubber and arrangements have been made by the Department of Agriculture for T. V. Thamotheram to visit several estates for experimental budding. Budding trials are being carried on at the Royal Botanic Gardens, Peradeniya. There are people who think that any attempts to increase yields should be discouraged. However, some producers feel that the rubber planting industry is about to be revolutionized and that it would never do to stay behind Java and Sumatra in such an important matter.

Malaya

The reports of rubber companies published from day to day in the local papers show an increasing number of estates that are declaring dividends, small dividends to be sure, but under present circumstances rather encouraging. These dividends are still more interesting as they come from estates that are carrying out voluntary restriction.

Some companies are cutting production almost 50 per cent by resting certain areas, adopting a lighter tapping system or selective thinning out, and while opinion is divided as to the desirability of compulsory restriction, none of these companies seems to allow the fact that others are not restricting to interfere with what it considers is best for its estate.

Not a few estates are profiting by the results of scientific research, and having learned that a large percentage of an estate's output is yielded by a small percentage of the trees, are instituting records of yields as an aid in selective thinning out or in carrying out a system of restriction and cutting costs at the same time. The Bikam Rubber Co. seems to have successfully solved the latter problem, for in its report it declares that with alternate daily tapping over one cut on one-fourth of the circumference, the output is cut down almost one-half, while the costs are 3d. per pound less. Apropos of what might be called "selective restriction," a correspondent of a local paper points out that compulsory restriction could advantageously be carried out along these lines.

Meanwhile, efficient managers are continuing to take careful stock of their estates, planning and carrying out schemes to suit their own peculiar cases without waiting to see what others will do, or without worrying about the profits others will derive from their efforts. Their good management seems to be yielding satisfactory results, so that one is tempted to ask who is making all the noise clamoring for restriction and demanding that retaliatory measures be taken against the Dutch for not cooperating.

One is also inclined to suggest that what Malaya needs is not compulsory restriction—which could never be planned so that it would be fair all around—but some efficiency experts who really know their business.

Costs, Labor and Restriction

A result of the slump that is worrying planters a good deal at present is the labor situation. In their first panic, many estates thoughtlessly discharged their coolies wholesale and despite constant warnings practically no efforts were made, either by the government or private individuals, to find some means of retaining the highly valued Tamil labor in the country. The sudden rise in the price of rubber toward the end of last year caused many estates to rush in search of labor and a serious situation would have followed had not the sagging of the market again resulted in the dismissal of a number of coolies.

At present a peculiar condition prevails. On the one hand, many coolies are returning to India for lack of employment, and

on the other, estates are recruiting labor in India. While for the time being labor costs continue at a satisfactorily low rate which are helped by lower food prices, particularly rice, the anomalous position described above is sure to produce uncomfortable results as soon as prices increase again and labor is in greater demand. It is estimated that there is a shortage of about 100,000 coolies. Many directors, therefore, are of opinion that the low costs attained will not continue long and that a spurt in production charges is due.

Rubber Goods

The *Straits Echo* announces that a leading British merchant of Shanghai is making serious efforts to found a rubber goods industry in China. This merchant has large interests in rubber in China and would establish well equipped factories at Shanghai which would be the principal distributing center for north, central and western China. Already several tons of rubber have been shipped from the Straits to Shanghai to this merchant who, it appears, has completed arrangements for making footwear and other articles of general utility which will be pushed by brokers at prices defying competition of similar leather goods.

Rubber Market Improvement

Quite a flutter was caused by the news that a three-fourths majority of the Dutch producers has decided to invite the government to consider measures to improve the position. The formation of a British-Dutch-American pool to hold and handle 100,000 tons of rubber is also being considered. In response to the rise on the London market, rubber went up to 30½ cents per pound on the Singapore market.

Netherlands East Indies

Rubber Estates of the Future

Victor Ris, visiting agent, Medan, Sumatra, has submitted to the *Archief voor de Rubbercultuur*, June, 1922, some interesting notes on future rubber estates.

Until very recently, says the writer, rubber estates were planted with unselected seed resulting in the variation of individual trees. Thus, 75 per cent of the trees yield 40 per cent of the crop and 25 per cent yield the balance of 60 per cent. These trees are referred to as Class A and Class B, respectively. Of the total number planted on an estate, 10 per cent may be said to yield 25 per cent while 1 per cent yields 5 per cent of the total crop. These trees are classed as C and D, respectively.

Under Class A are included many trees which yield no latex. Under Class D are included trees whose records show a yield of 55 to 60 pounds year after year.

If the average estate now yielding 400 pounds per acre were planted with Class B trees, the yield could be expected to reach 960 pounds per annum; if only Class C trees were planted, the yield would be 1,000 pounds and in the case of Class D trees this would be 2,000 pounds per annum.

This shows the need for careful selection of planting material which has been recognized for many years in the Netherlands East Indies and extensive experiments have been going on. So far the greatest success has been obtained with bud-grafting. The A. V. R. O. S. (East Coast of Sumatra Rubber Growers' Association) experiment station supplied to its members during 1921 about 6,000 meters of selected stock for bud-grafting.

Seed selection is a slower method, but better results are expected when eventually a pure line selection is obtained. After extensive and costly experiments it has been possible to obtain self-pollina-

tion on some selected high yielders which it is hoped will lead the way to the isolation of "pure lines," the ideal selection.

THE INFLUENCE OF SOIL SELECTION

Experience has shown that rubber cannot be profitably grown on every kind of soil. The great variation in yields on different estates in Sumatra proves this conclusively. The yield per acre varies from 250 to 600 pounds and over, per acre. If about 80,000 acres of land on the East Coast of Sumatra, yielding less than 300 pounds per acre, are left out of consideration, the average crop per acre works out at 400 pounds. Taking into consideration that large areas yield 600 pounds and more, it becomes evident that proper soil selection would increase the yield by 50 per cent.

Therefore, if seed selection were combined with soil selection, Class B trees could be expected to yield 1,440 pounds per acre, Class C trees, 1,500 pounds per acre, and Class D trees, 3,000 pounds per acre.

It may be taken for granted that the average estate yielding 400 pounds per acre and not restricting, can put its product on the market at an all-in cost of 8d. a pound. Of this about 5d. go for estate costs and 3d. for further charges to London. The all-in cost for estates yielding 1,000 pounds per acre would be about 5d. per pound. The net return per acre yielding 400 pounds as compared with that per acre yielding 1,000 pounds works out as follows:

Sale price pence per pound	Net return per acre yielding 400 pounds	Net return per acre yielding 1,000 pounds
5	Loss £5	Profit £. 3. 4
6	Loss 3. 6. 8	Profit 4. 3. 4
7	Loss 1. 13. 4	Profit 8. 6. 8
8	Profit 1. 13. 4	Profit 12. 10. 0
9	Profit 3. 6. 8	Profit 16. 13. 4
10	Profit 5. 0. 0	Profit 20. 16. 8
11	Profit 6. 13. 4	Profit 25.
12		Profit 29. 3. 4

The uncertain factor of government income taxes has been left out of account.

The actual capital cost per acre of the existing 400 pound-yielders is probably between £50 and £60, while the cost of the 1,000 pound yielders of the future will probably be between £70 and £80.

In conclusion, the writer points out that it would be well to bear in mind the excellent results obtained in the Netherlands East Indies during the latter half of the last century in the cultivation of the sugar cane, cinchona and tobacco, and to remember that no other eastern tropical colonies can compete successfully with the Netherlands East Indies on the world's market in these lines.

Rubber Areas in Sumatra

According to the Commercial Association of Medan the area under rubber in Sumatra increased 8,000 hectares during 1921 despite unfavorable conditions. Figures from 1914, including East Coast of Sumatra and East Coast of Atjeh but excluding Tapanuli, are as follows:

	Planted area	Area producing	Percentage in production
1914	75,093	16,579	22.07
1915	98,313	36,453	37.08
1916	106,413	51,874	48.75
1917	121,490	70,471	58.00
1918	120,331	77,938	64.77
1919	144,985	97,350	67.15
1920	149,649	101,006	67.50
1921	157,756	101,487	64.33

The total production of the East Coast from 1915 is as follows: 9,722,786 kilos in 1915; 15,978,464 kilos in 1916; 22,292,140 kilos in 1917; 21,496,424 kilos in 1918; 33,677,117 kilos in 1919; 36,984,460 kilos in 1920; 32,557,072 kilos in 1921.

The estimated production for 1921 was 45,080 metric tons so that there was an actual restriction of output amounting to about 28 per cent although the crop was larger than expected. If no restriction is carried out, it is considered the crop for 1922 will reach 47,070 metric tons (a metric ton equals 2,204 pounds).

Sale of Rubber Estates

While there are persons desirous of buying up rubber estates on the East Coast of Sumatra, few estates have changed hands as bids are low. The United Serdang Plantation Co. had voted £250,000 for the purpose of acquiring estates that are selling out, but it is not yet known whether any purchases have been made. The Tainbunan and Sungei Birung estates of the London Langkat Syndicate are to be sold. These estates cover 1,500 and 670 acres, respectively, and it is rumored, have lost 2,700,000 guilders.

Burma

During the fiscal year ended March 31, 1921, Burma exported, in round numbers, 4,153,000 pounds of rubber, of which 3,800,000 pounds went to England, 245,700 to the Straits Settlements, 57,400 to Ceylon, and 44,800 pounds to America.

PLANTING STILL PROFITABLE

That all rubber planting companies are not ruined is indicated by figures from a few recent reports.

TELUK PIAH RUBBER ESTATE: In spite of a fall in prices obtained—1s. 0.09d. to 7.98d. per pound, a profit of £1,257.29 was recorded against a loss of £99.11s. the year before. Only absolutely necessary works are carried on, but the estate is well managed. The crop was estimated at 185,292 pounds, but owing to restriction was actually 153,100 pounds.

CROMLIX RUBBER ESTATE AND PRODUCE SYNDICATE, LIMITED. The average gross price per pound was 12.36d. and costs 9.64d., which yielded a net profit of £1,791.12s. The output was 243,600 pounds, a reduction of fully 30 per cent on the previous year's crop.

BATU CAVES RUBBER COMPANY. The financial position is strong. Owing to forward contracts an average price of 1s. 8½d. was secured, against an all-in cost of 9.41d. per pound. Restriction has been carried out and will continue on the program.

NORDANAL (JOHORE) RUBBER ESTATES. The profit for the year was £6,291.

SHANGHAI MALAY RUBBER ESTATES, LIMITED. A small profit of 1,403.34 taels is reported. Costs were reduced from 12.90d. to 6.70d.

LANGKAT RIVER (SELANGOR) RUBBER CO. The rubber yielded 137,446.69 rupees against costs of 132,376.41 rupees, leaving a profit of 5,070.28 rupees.

SHALIMAR (MALAY) ESTATE CO., LIMITED. The strong financial position of this company made it possible to distribute a dividend of 10 per cent. Bonuses of \$1,000 and \$500 were turned out to the two supervisors of the estates.

THE BAGAN SERAI CO., LIMITED. Profits for the year were £11,584. A dividend of 2½ per cent was declared.

HEVEA BUDDING KNIFE

In the article on budding and marcottage of Hevea, published in THE INDIA RUBBER WORLD, May 1, 1922, reference was made



to a special knife which has been found well adapted to preparing bud grafts. This knife which is shown in the illustration has a single strong sharp blade of peculiar form. It is known as the "Keen Kutter" cotton knife, presumably because of its value to the special needs of cotton planters.—Simmons Hardware Co., St. Louis, Missouri.

Recent Patents Relating to Rubber

The United States

Issued* July 4, 1922

- N^{O.} 1,421,407 Return ball. W. H. Clark, West Burlington, N. Y.
 1,421,414 Captive ball practice device. C. F. Craig, San Francisco, Calif., assignor to Craig Golfmeter Co., Wilmington, Del.
 1,421,420 Pressure retaining dust cap for pneumatic tire valves. T. J. Dery, Windsor, Ontario, Canada.
 1,421,490 Permanent air gage for pneumatic tires. E. Jung, St. Louis, Mo.
 1,421,537 Reinforced soft rubber tire filler. M. W. Needham, Waco, Tex.
 1,421,642 Quick-detachable dust cap for pneumatic tires. W. E. Williams, Chicago, Ill.
 1,421,690 Rubber garter. E. G. Howard, Cincinnati, O.
 1,421,755 Cushion tire and rim. U. Anderson, Wausau, Wis.
 1,421,818 Rubber mat. C. H. Oakley, Trenton, N. J.

Issued* July 11, 1922

- 1,422,068 Pressure-signaling device for tires. W. F. Arndt, Watertown, Wis.
 1,422,113 Pneumatic tire. W. McEwen, assignor of one-half to W. C. S. Hosking—both of Waiuku, Auckland, New Zealand.
 1,422,123 Two-in-one rubber tire. W. O'Connell, Cincinnati, O.
 1,422,256 Cap gage for pneumatic tires. F. A. Conrad and J. L. Conrad—both of Los Angeles, Calif.
 1,422,290 Tire casing. D. Moriarty, Oakland, Calif.
 1,422,291 Hollow soft rubber bath spray with hard rubber ring in groove around edge. J. A. Mulherin, assignor of one-third to H. D. Delkeskamp—both of St. Louis, Mo.
 1,422,446 Detachable rubber heel. L. Kaplan, New York, N. Y.
 1,422,495 Repair patch for pneumatic tires. A. Thiele, Magdeburg, assignor to Firm of Emmy-Thiele, Berlin—both in Germany.
 1,422,550 Friction-driving device. H. C. Egerton, Ridgewood, N. J.
 1,422,642 Producing a rubber globe for use as educational toy. E. M. Walters, Hove, Eng.
 1,422,716 Shoe sole with resilient projections. P. Jones, Hanson, assignor to Commonwealth Shoe and Leather Co., Whitman—both in Mass.
 1,422,778 Atomizer. E. C. Petcher, St. Louis, Mo.

Reissues

- 15,405 Tire. W. G. Fording, Cleveland, O., assignor to The Fisk Rubber Co., Chicopee Falls, Mass.

Issued* July 18, 1922

- 1,422,851 Tire. W. R. Halfpenny, Juniata, Pa.
 1,422,854 Double cushioned shoe heel or lift. M. G. Hart, Elyria, O.
 1,422,887 Running board mat. R. H. Phillips, Trenton, N. J.
 1,422,899 Tire. D. L. Stouch, York, Pa.
 1,422,921 Cushion tire. E. Bylund, Winnipeg, Manitoba, Canada.
 1,423,065 Bed bottom with supporting elements formed of rubber reinforced with textile material. S. L. Arnold, Woodlawn, Pa.
 1,423,074 Airless tire. C. H. Braden, assignor to National Airless Tire Co.—both of Los Angeles, Calif.
 1,423,232 Inner tube. H. Lobel, assignor to Compression Tube & Tire Co.—both of Los Angeles, Calif.
 1,423,277 Pneumatic tire. G. E. Stuart and C. A. Stuart—both of Oregon City, Ore.
 1,423,399 Detachable rubber heel. A. Costantino, Providence, R. I.
 1,423,423 Tire liner. C. F. Hicks, Romeo, Mich.
 1,423,447 Maximum-pressure inflating valve and gage. S. B. Noe, Ocean Grove, N. J.
 1,423,448 Fountain pen. J. A. O'Connor, Bridgeport, Conn.
 1,423,463 Stopper for hot-water bottles. A. B. Shaw, Medford, assignor to Shaw Specialty Co., Inc., West Medford—both in Mass.
 1,423,464 Stopper for hot-water bottles. A. B. Shaw, Medford, assignor to Shaw Specialty Co., Inc., West Medford—both in Mass.

Issued* July 25, 1922

- 1,423,515 Dust cap. A. B. Catterall, Ottumwa, Ia.
 1,423,526 Product obtained from rubber-containing latex. E. Hopkinson, New York, N. Y., assignor to General Rubber Co., a New Jersey corporation.
 1,423,549 Cushion tire. J. J. P. Walsh, New York, N. Y.
 1,423,580 Resilient core for motor tires. G. A. H. Robbins and S. F. E. Einsiedel—both of Brisbane, Queensland, Australia.
 1,423,593 Holder for hot-water bottle stoppers. F. E. Baldwin, Philadelphia, Pa.
 1,423,748 Sectional inner strip for automobile tires. W. Berman, New York, N. Y.
 1,423,771 Pneumatic-tire casing. N. W. McLeod, New York, N. Y.
 1,423,837 Ball. I. De Gowin, assignor to The Seamless Rubber Co., Inc.—both of New Haven, Conn.
 1,423,873 Valve device for pneumatic tires. J. N. Newsom and H. E. Harder, assignor to Newsom Valve Co.—all of St. Louis, Mo.
 1,424,108 Hydrometer. J. O. Luthy, San Antonio, Tex.
 1,424,131 Pneumatic-tire tread. B. Darrow, assignor to The Goodyear Tire & Rubber Co.—both of Akron, O.
 1,424,135 Inner tube for pneumatic tires. C. B. Orr, assignor to The Goodyear Tire & Rubber Co.—both of Akron, O.

* Under Rule No. 167 of the United States Patent Office, the issue closes weekly on Thursday, and the patents of that issue bear date as of the fourth Tuesday thereafter.

The Dominion of Canada

Granted July 4, 1922

- 220,438 High potential detector with hard rubber tube. The Canadian Westinghouse Co., Ltd., Hamilton, Ontario, assignee of C. C. van Voorhis, East Orange, New Jersey, U. S. A.
 220,513 Rubber heel. F. A. Nolan, St. Paul, Minn., U. S. A.
 220,564 Combination fountain pen and perpetual feed pencil. H. E. Crow, Topeka, Kan., U. S. A.
 220,571 Pneumatic tire with sectional inner tube. E. G. Fido, Auckland, New Zealand.
 220,572 Garter. H. Grund, Chicago, Ill., U. S. A.
 220,593 Dust cap valve. H. G. Slater, Watts, Calif., U. S. A.
 220,595 Inflatable tube of cord fabric and rubber. H. Stanyon, Toronto, Ontario.

Granted July 18, 1922

- 220,909 Cushion wheel. W. B. Goodwin, Columbus, Ohio, U. S. A.
 220,912 Water game employing hose and a ball. T. F. Graham, Chicago, Ill., U. S. A.
 221,044 Garter. The George Frost Co., Boston, Mass., assignee of B. A. Moore, Waterbury, Conn.—both in the U. S. A.
 221,069 Tire pressure gage. A. Schrader's Son, Inc., assignee of M. C. Schweinert—both of New York, N. Y., U. S. A.
 221,070 Gage for pneumatic tires. A. Schrader's Son, Inc., New York, N. Y., assignee of H. P. Kraft, Ridgewood, N. J.—both in the U. S. A.
 221,071 Tire valve. A. Schrader's Son, Inc., New York, N. Y., assignee of H. P. Kraft, Ridgewood, N. J.—both in the U. S. A.
 221,072 Water bottle stopper. A. Schrader's Son, Inc., assignee of M. C. Schweinert—both of New York, N. Y., U. S. A.
 221,073 Inflating coupling. A. Schrader's Son, Inc., New York, N. Y., assignee of H. P. Kraft, Ridgewood, N. J.—both in the U. S. A.
 221,074 Dust cap for tire valves. A. Schrader's Son, Inc., New York, N. Y., assignor of H. P. Kraft, Ridgewood, N. J.—both in the U. S. A.
 221,162 Pneumatic tire. The Porter Cord Tube Co., Morristown, N. J., assignee of W. P. Porter, New York, N. Y.—both in the U. S. A.

Granted July 25, 1922

- 221,187 Garter. M. B. Hammond and H. H. Taylor—both of Bridgeport, Conn., U. S. A.
 221,235 Fountain pen. H. W. Dickens, Chicago, Ill., U. S. A.
 221,242 Pneumatic tire with sectional inner tube. W. H. Emeno, Chelsea, Mass., U. S. A.
 221,470 Woman's undergarment with elastic inserts. The Warner Brothers Co., assignee of D. H. Warner—both of Bridgeport, Conn., U. S. A.
 221,511 Transparent tire tube cap. I. Pulverman, Warren, Pa., U. S. A.

The United Kingdom

Published July 5, 1922

- 179,652 Pneumatic-tire pressure gage. W. A. Harris, 238 John street, Greenville, South Carolina, U. S. A.
 179,695 Waterproof paddler or wader for children. A. F. Raven, 17, Chapel street, Cripplegate, London.
 179,734 Webbed swimming-glove. A. Gravel, Chicoutimi, Quebec, Canada.
 179,740 Spraying apparatus with hard rubber container, etc. C. A. O. Saxelby and Benton & Stone, Ltd.—both of Bracebridge street, Birmingham.
 179,747 Rubber studs for sport shoes, etc. K. A. S. Clarke, 2 Albert Gate Court, Knightsbridge, London.
 179,786 Catamenial appliance of rubber or rubberized fabric. E. H. Lawrence, 62 Cheriton Square, Upper Tooting, London.
 179,844 Reinforced pneumatic tire. P. Evancho, Oneida, Pa., U. S. A.
 179,937 Dirigible balloon. L. Rith, 43 Rue Legendre, Paris, France. (Not yet accepted.)

Published July 12, 1922

- 180,155 Resilient heel pad. A. E. Alexander, 306 High Holborn, London; C. H. Oakley, Trenton, New Jersey, U. S. A.
 180,170 Acid-proof box formed of layers of ebonite or vulcanite, canvas and soft rubber. New Eccles Rubber Works, Ltd., and S. W. Cox, Monton Road, Eccles, Lancashire.
 180,206 Pneumatic tire protector. F. Cressley, 106 Upper Parliament street, Nottingham.
 180,257 Glove for wicket-keeping, cycling or gardening with rubber pads on the palm, etc. E. Goodwin, 281 Great Colmore street, Birmingham.
 180,268 Rubber heel pad. R. Surridge and C. F. Symonds, 73 Church street, Camberwell, London.
 180,305 Inner tube. J. Viven, Villefranche de Rouergue, Aveyron, assignee of R. Favard, 21 Avenue Frizac, Toulouse—both in France. (Not yet accepted.)
 180,319 Cushion tire. C. S. Preston, 3141 Curlew street, San Diego, Calif., U. S. A. (Not yet accepted.)

Published July 19, 1922

- 180,340 Tire valve pump couplings. A. Schrader's Son, Inc., 470 Vanderbilt avenue, Brooklyn, N. Y., assignee of H. P. Kraft, 219 Godwin avenue, Ridgewood, N. J.—both in the U. S. A. (Not yet accepted.)

- 180,382 Tire interliner. W. C. Taylor, Fairview, College Road, Heath End, Farnham, Surrey.
 180,459 Rubber-surfaced concrete paving-blocks. J. H. deW. Waller, 115 Grafton street, Dublin, Ireland.
 180,460 Rubber-faced concrete paving-blocks. J. H. deW. Waller, 115 Grafton street, Dublin, Ireland.
 180,498 Rubber soles, heels and protectors provided with canvas tabs vulcanized thereto for attaching. A. H. Bancroft, 70 Market street, Church Accrington, Lancashire.
 180,527 Liquid soap distributor. R. L. Delperier, 62 Rue de Saintonge, Paris, France.
 180,637 Cushion tire. International Overman Tire Corporation, 109 Broad street, assignee of M. C. Overman, 250 West 54th street—both in New York, New York, U. S. A.

Published July 26, 1922

- 180,702 Spring wheels with pneumatic hub. T. L. Boyden, 1201 Broad street, Victoria, British Columbia.
 180,883 Sole and heel for athletic boots and shoes. O. W. H. Briggs, St. Mary's Road, Market Harborough, Leicestershire.
 180,913 Device for securing rubber heel protectors. J. W. Horton, 8 Garfield street, Kettering.
 180,920 Reservoir pen. F. M. Peart, Grove House, Seaview Road, Liscard, Cheshire.
 180,939 Reinforced cushion tire with spaced partitions. E. Brunswick, 44 Rue du Faubourg du Temple, Paris, France.
 180,946 Shaving-brush with rubber bristles. T. G. N. Bating, 12 Vale Road, Southborough, Kent.
 180,961 Device for collecting latex. H. Kloosterboer, Tanggoel, Java.
 180,995 Tire fabric. Tape Tire Corporation, assignee of F. B. Carlisle—both of 606 Eitel Building, Seattle, Wash., U. S. A.

Germany

Patents Issued, with Dates of Issue

- 357,774 (June 27, 1920). Ball syringe. Becton Dickinson & Co., Rutherford, New Jersey, U. S. A.; represented by Dr. E. Moldenhauer, Düsseldorf.
 357,775 (October 9, 1921). Irrigator. Arthur Dehn, Kottbuser. Damm 65, Berlin.
 358,438 (October 7, 1920). Atomizer. Société Asie Lévy & Cie., Boulogne-sur-Seine, France; represented by G. Hirschfeld, Berlin, S. W. 68.
 358,471 (February 12, 1922). Disk wheel of solid rubber. Georges Brouhiet, St. Etienne, Loire, France; represented by F. Melfert and Dr. L. Sell, Berlin, S. W. 68.
 358,819 (January 6, 1921). Syringe. Friedrich Kohler, Tuttlingen, Württemberg.
 358,928 (March 15, 1921). Cushion tire. Demetrio Maggiora, Florence, Italy; represented by C. Fehlert, G. Loubier, F. Harmsen and E. Meissner, Berlin, S. W. 61.
 358,930 (February 28, 1918). Detachable tread. Reinhold Gollert, Kniephofstrasse 48, Berlin-Steglitz.
 359,194 (June 18, 1920). Soles composed of rubber and fabric. United Shoe Machinery Co., Akron, Ohio, U. S. A.; represented by K. Hallbauer and A. Bohr, Berlin, S. W. 61.

Design Patents Issued, with Dates of Issue

- 817,169 (May 1, 1922). Flowers of sheet rubber or rubberized fabric. Fritz Thiele, Springerstrasse 9, Leipzig.
 817,187 (May 10, 1922). Rubber sole, to be attached by nailing. Gummiwerke Paffrath A.-G., Bergisch-Gladbach.
 817,188 (May 10, 1922). Rubber sole, to be attached by gumming. Gummiwerke Paffrath A.-G., Bergisch-Gladbach.
 817,189 (May 10, 1922). Rubber sole. Gummiwerke Paffrath A.-G., Bergisch-Gladbach.
 817,233 (April 29, 1922). Three-color stamp. H. F. A. Pätzmann, Rautenbergstrasse 11, Hamburg.
 817,291 (May 3, 1922). Rubber closing for autoclave presse. Otto Ihlau, Hanover-Lantenforth.
 817,434 (May 12, 1922). Rubber type with auxiliary body. Paul Thommen, Basle, Switzerland; represented by Dominik Fischer, Grenzach.
 817,478 (May 13, 1922). Chambered air tube for vehicles. Charles Amberg, Bulowstrasse 19, and Hans Moack, Schulstrasse 18, Berlin.
 817,541 (July 28, 1916). Tire with exchangeable tread coupled to it by means of ribs fitting into corresponding grooves.
 818,295 (May 23, 1922). Rubber heel. Edmund Balke, Wokrenterstrasse 14, Rostock, Mecklenburg.
 819,061 (May 26, 1922). Portio pessary. Hermann Haertel, Weidenstrasse 83, Breslau.
 819,081 (December 27, 1918). Sheet packing encased in metal. Josef Popp, Teuernsee.
 819,087 (October 18, 1921). Soft rubber valve for ink holders of fountain pens. Reinhold Wadel, Rathausring 3, Leipzig.
 819,309 (May 20, 1922). Air-tight rubber fastening especially for glasses to hold candy samples. Adolf Korwan, Grenzstrasse 12-14, Karlsruhe.
 819,391 (April 28, 1922). Rubber sole with central depression. Max Gotze, Biesterstrasse 6, Hanover.
 819,415 (May 29, 1922). Bicycle casing protector of rubber with fabric insert. Gottfried Steven, Gustav-Freytagstrasse 19, Dresden-Blasewitz.
 819,429 (June 7, 1922). Stuffing box packing. Paul Schlawinski, Schöpfung near Eberswalde, Mark.
 819,430 (June 7, 1922). Stuffing box packing. Paul Schlawinski, Schöpfung near Eberswalde, Mark.
 819,516 (May 29, 1922). Rubber heel. Gummiwerke Paffrath Akt.-Ges., Paffrath near Bergisch-Gladbach.
 819,860 (June 9, 1922). Exchangeable rubber heel. Christian Schweiker, Schillerstrasse 28, Frankfurt-on-the-Main.
 820,064 (April 18, 1922). Packing for rubber heels. Schwelmer Gummiwaren-Gesellschaft, Schwelm, Westphalia.
 820,109 (June 9, 1922). Air-cushion for bathing costumes. Helene Rost, née Georgie, Mühlenstrasse 31, Chemnitz.
 820,110 (June 9, 1922). Bathing costume with swimming apparatus. Helene Rost, née Georgie, Mühlenstrasse 31, Chemnitz.

Trade Marks

The United States

Two Kinds of Trade Marks Now Being Registered

Under the rules of the United States Patent Office, trade marks registered under the Act of February 20, 1905, are, in general, fanciful and arbitrary marks, while those registered under the Act of March 19, 1920, Section 1 (b), are non-technical, that is, marks consisting of descriptive or geographical matter or mere surnames. To be registered under the latter act, trade marks must have been used for not less than one year. Marks registered under this act are being published for the first time when registered, any opposition taking the form of an application for cancellation.

Granted July 4, 1922, Act of February 20, 1905

- 156,582 DICTATOR—fountain pens. The Dictator Fountain Pen Co., Inc., New York, N. Y.

Act of March 19, 1920, Section 1 (b)

- 156,594 GOETZE—machinery packing of asbestos and metal. The Goetze Gasket & Packing Co., North New Brunswick, N. J.
 156,601 RELIABLE—electrical supplies including cable insulating compound. Reliable Electric Co., Chicago, Ill.

Granted July 11, 1922, Act of February 20, 1905

- 156,647 CLIMAX—tires and tire tubes, liners, and patches. The Climax Rubber Co., Columbus, O.
 156,657 2-PIEX—electric insulating tape. Diamond Holfast Rubber Co., Atlanta, Ga.
 156,738 YELLOW KID—chewing gum. Pulver Co., Inc., Rochester, N. Y.
 156,753 KANDEX NOTE, the letter K serving to begin both words—chewing gum. The Shelby Supply & Manufacturing Co., Cleveland, O.
 156,827 BRUNSWICK—tires and tubes. The Brunswick-Balke-Collender Co., Wilmington, Del., and Chicago, Ill.

Act of March 19, 1920, Section 1 (b)

- 156,823 WAHL—fountain pens. The Wahl Co., Chicago, Ill.

Granted July 18, 1922, Act of February 20, 1905

- 156,838 DANDEE—tire tube patches. F. H. Binnering, Cleveland, O.
 156,839 DANDEE TUBE PATCH and representation of two male figures pulling at a patched tube—F. H. Binnering, Cleveland, O.
 156,840 EVEREDY TUBE PATCH and representation of a male figure against conventional background—sheet rubber patches for tire tubes, hot-water bottles, raincoats, overshoes, rubber boots and shoes, garden hose, and rubber bulbs. F. H. Binnering, Cleveland, O.
 156,869 ALL-IN-ONE—tire retreads of rubber and fabric in the piece. The General Tire & Rubber Co., Akron, O.
 156,870 RAIN-DOGGER—combined hood and cape. R. M. Goldfrederick, R. M. Goldfrederick Co., Chicago, Ill.
 156,879 HOLMAC above representation of a golf ball accompanied by two crossed golf clubs, all within a heavy circle—golf supplies, including balls and grips.
 156,887 Representation of an apple—chewing gum. J. G. Kitchell, assignor to Apple Gum Co., Inc.—both of New York, N. Y.
 156,888 APPLE—chewing gum. J. G. Kitchell, assignor to Apple Gum Co., Inc.—both of New York, N. Y.
 156,912 POLKASE KIDNEY KIT—infants' rubber outfits, including pants and crib and carriage sheets. Polkase Manufacturing Co., New York, N. Y.
 156,939 MYSTICS—chewing gum. J. W. Wood, Poughkeepsie, N. Y.

Granted July 25, 1922, Act of February 20, 1905

- 156,974 ABBOTT SHOE CO. on representation of a winged seal bearing the letter A in the center—boots, shoes, and slippers of leather, rubber, fabric, etc., and combinations. Abbott Shoe Co., North Reading, Mass.
 156,985 ANUCA within a diamond superimposed upon representation of an anchor bearing an eagle—raincoats for men, women, and children. American Naval Uniform Co., Hyde Park, Mass.
 156,993 SUNBEAM—tires and tubes. Austin, Nichols & Co., Inc., Richmond, Va.
 157,020 STUTE STREAMLINE SHOES—shoes of leather, rubber, fabric, and combinations. F. A. Butler, New York, N. Y.
 157,032 WESTBROS—brake linings. A. J. Conrad, Kansas City, Mo.
 157,052 WEARITE—rubber soles and heels. Essex Rubber Co., Trenton, N. J.
 157,056 THE GRANT FLEXATED SHOE FOR MEN, FOR WOMEN—shoes and boots of leather, rubber, fabric, or combinations. The Excelsior Shoe Co., Portsmouth, O.
 157,063 The letter F on a circular disk between two conventionalized triangular disks colored red—tires and tire casings. The Fisk Rubber Co., Chicopee Falls, Mass.
 157,103 ARROW—rubber heels. Hood Rubber Co., Watertown, Mass.
 157,106 Representation of a tire through which a bridge passes, all within a rectangular border of the same design as that of the tire tread; the tire bearing the words HUDSON SUPER CORD MFD. BY HUDSON TIRE CO., NEWARK, N. J., U. S. A.—tires. Hudson Tire Co., Inc., Newark, N. J.
 157,109 IDEAL—shoes of leather, rubber, fabric, and combinations. Ideal Shoe Manufacturing Co., Milwaukee, Wis.
 157,111 RED INDIAN—chewing gum. The India Co., Newark, N. J.
 157,120 SANTILETTE—women's undergarments and sanitary pantlettes. L. B. Kleiner Rubber Co., New York, N. Y.
 157,129 SIERRA and representation of mountain peaks within an oval—tires. B. Lichtig & Son, Inc., Oakland, Calif.
 157,144 MASTER—rubber belting and hose. The Manhattan Rubber Manufacturing Co., Passaic, N. J.
 157,162 NOVA—heels of rubber and leather in combination. Nova Heel Manufacturing Co., Berkeley, Calif.
 157,177 LITTLE QUEEN—men's, women's, and children's boots, shoes, and slippers of leather, rubber, etc., and combinations. Thomas G. Plant Co., Boston, Mass.
 157,178 GROWING QUEEN—men's, women's, and children's boots, shoes, and slippers of leather, rubber, etc., and combinations. Thomas G. Plant Co., Boston, Mass.

- 157,183 Representation of section of brake lining with gold-colored coating on edge—brake lining. The Raybestos Co., Bridgeport, Conn.
- 157,195 Circular green disk—boots and shoes of a combination of leather, rubber, and fabric. Rubberhide Co., Boston, Mass.
- 157,196 LIBERTY and representation of the Statue of Liberty—rubber heels. A. L. Runyan, Omaha, Neb., assignor to The Anchor Grip Heel Co., Willoughby, O.
- 157,227 BUCKSKIN—rubber tires. The Tuscan Tire & Rubber Co., Carrollton, O.
- 157,232 HONKONK PRODUCTS—sheet rubber patches. United States Sales Corporation, St. Louis, Mo.

Act of March 19, 1920, Section 1 (b)

- 157,271 SCAPE—combination rubber and leather heels. J. K. Krieg Co., New York, N. Y.
- 157,280 NEWARK—leather, rubber and fibrous boots, shoes, and slippers. M. Samuels & Co., Baltimore, Md.
- 157,282 KANT-STICK—hydrometer syringes. Scranton Glass Instrument Co., Inc., Scranton, Pa.

The Dominion of Canada**Registered**

- 31,384 NORWALK—tires and tubes. The Norwalk Tire & Rubber Co., Norwalk, Conn., U. S. A.
- 31,394 TIGER—rubber heels. Panther Rubber Co., Ltd., Sherbrooke, Que.
- 31,395 LYNN—rubber heels. Panther Rubber Co., Ltd., Sherbrooke, Que.
- 31,396 PANCORD—rubber heels. Panther Rubber Co., Ltd., Sherbrooke, Que.
- 31,397 PANGO—rubber soles and taps. Panther Rubber Co., Ltd., Sherbrooke, Que.
- 31,400 DOSCAT—rubber products. Doscat Tire & Rubber Corporation, Rochester, New York, U. S. A.
- 31,492 Representation of an arrow—tires and accessories. Hood Rubber Co., Watertown, Mass., U. S. A.
- 31,493 NIAGARA—pneumatic and solid tires, hose, belts and belting, packing, mats and matting, tubing, valve pads, heels and soles, cement weather stripping and tape. Dunlop Tire & Rubber Goods Co., Ltd., Toronto, Ont.

The United Kingdom**Published June 28, 1922**

- 414,918 THARO—composition chiefly of rubber, for repairing boots, shoes, etc. Arrowsmith, Jnr., Rogers & Co., 104 High Holborn, London, W. C. 1.
- B417,605 I. T. S.—rubber heels and soles for boots and shoes. I. T. S. Rubber Co., Ltd., 42 Great Russell Street, London, W. C. 1.
- 425,109 JEDDITE—rubber soles for boots and shoes. Peal & Co., 487 Oxford street, London, W. 1.

Published July 5, 1922

- B420,159 "THE 'HARDY'"—woven fabric disks, impregnated with rubber, for use in flexible couplings. Ed. J. Hardy & Co., Ltd., 118 Queen Victoria Road, Coventry, Warwickshire, England.
- 423,459 JEWEL—combs. New-York Hamburger Gummi-Waaren Compagnie, 30 Hufnerstrasse, Hamburg 33, Germany; for service in the United Kingdom, care of Jensen & Son, 77 Chancery Lane, London, W.C.2.
- 423,752 PENTAGON—golf balls. India-Rubber Gutta-percha & Telegraph Works Co., Ltd., 106 Cannon street, London, E.C.4, and Winchester street, Silvertown, London.

Published July 19, 1922

- 420,223 Three red stripes—hose. F. Reddaway & Co., Ltd., Victoria Mills, Cheltenham street, Pendleton, Manchester, Lancashire.
- 424,730 ECLIPSE—all rubber goods included in Class No. 40, except certain ones named. J. G. Ingram & Son, Ltd., The London India Rubber Works, Felstead street, Hackney Wick, London, E.9.
- 425,616 Representation of a seal bearing the monogram BCH—asbestos high-pressure packing, composition moldings containing asbestos, etc. J. Burns, Ltd., Wangye Works, High Road, Chadwell Heath, Essex.
- 426,344 FASTIO—rubber and gutta percha articles included in Class No. 40. H. J. D. Thompson, 87 Charlton Road, Blackheath, London, S.E.3.

Published July 26, 1922

- 416,102 CONTINENTAL between two seals bearing the figure of a horse and the initials C. C. & G. P. Co. H.—rubber and gutta percha goods not included in classes other than class No. 40. Continental Caoutchouc und Gutta-Percha Compagnie, 100 Vahrenwalderstrasse, Hanover, Germany; address for service in United Kingdom, care of Lloyd Wise & Co., 10 New Court, Lincoln's Inn, London, W. C. 2.
- 420,299 P-K on representation of a piece of chewing gum held by Brownie-type figure in front of double-pointed arrow—chewing gum. Wm. Wrigley Jr. Co., 400 North Michigan avenue, Chicago, Ill., U. S. A.; address for service in United Kingdom, care of Marks & Clerk, 57-58 Lincoln's Inn Fields, London, W. C. 2.

- 420,300 P-K on representation of a piece of chewing gum in front of double-pointed arrow—chewing gum. Wm. Wrigley Jr. Co., 400 North Michigan avenue, Chicago, Ill., U. S. A.; address for service in United Kingdom, care of Marks & Clerk, 57-58 Lincoln's Inn Fields, London, W. C. 2.

- B421,292 THE VULCAN BRITISH MANUFACTURE DENTAL RUBBER on representation of label bearing figure of Vulcan—dental rubber. The Vulcan Dental Manufacturing Co., Ltd., 9A, The Village, Old Charlton, London, S. E. 7.

- 421,954 "VERBRO" within an ellipse—rubber goods not included in classes other than No. 40. V. Brown, 38 South Meadow Lane, Preston, Lancashire.

New Zealand**Published June 15, 1922**

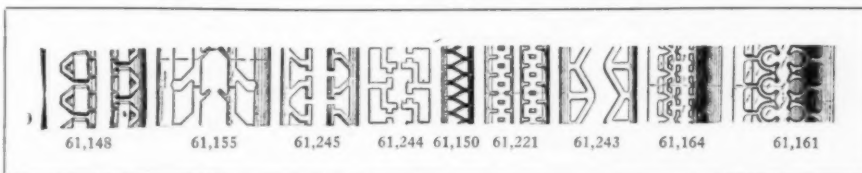
- 18,885 SPENWOOD—all kinds of rubber goods included in Class No. 40. Wood-Milne Ltd. and George Spencer-Moulton Co., Ltd., 2 Central Buildings, Westminster, London, Eng.

Designs**The United States****Issued* July 4, 1922**

- 61,148 Tire tread. Term 14 years. H. S. Berlin, assignor to The Victor Rubber Co.—both of Springfield, O.
- 61,150 Solid rubber tire. Term 14 years. H. H. Boucher, Los Angeles, Calif.
- 61,156 Rubber heel. Term 14 years. D. Freeman, Roxbury, assignor to Panther Rubber Manufacturing Co., Stoughton—both in Mass.
- 61,157 Rubber sole or tap. Term 14 years. D. Freeman, Roxbury, assignor to Panther Rubber Manufacturing Co., Stoughton—both in Mass.
- 61,161 Tire. Term 14 years. W. F. Hoelzer, New Brunswick, and J. T. Johnson, Plainfield—both in N. J.
- 61,164 Tire. Term 14 years. J. T. Johnson, Plainfield, N. J., assignor to O. J. Kuhlke, Akron, O.

Issued* July 18, 1922

- 61,221 Tire. Term 14 years. W. Carnal, Akron, assignor to The Carey Tire & Rubber Co., Carey—both in Ohio.
- 61,243 Tire tread. Term 14 years. H. D. Mitchell, assignor to C. Kenyon Co.—both of Brooklyn, N. Y.
- 61,244 Tire tread. Term 14 years. H. D. Mitchell, assignor to C. Kenyon Co.—both of Brooklyn, N. Y.



- 61,245 Tire tread. Term 14 years. H. D. Mitchell, assignor to C. Kenyon Co.—both of Brooklyn, N. Y.

* Under Rule No. 167 of the United States Patent Office, the issue closes weekly on Thursday, and the patents of that issue bear date as of the fourth Tuesday thereafter.

WESTINGHOUSE ELECTRIFICATION APPARATUS

A consignment of railroad electrification apparatus, said to be the largest single shipment of such material, has been recently forwarded to Chile for the Chilean State Railways. The contract, amounting to approximately \$7,000,000 in value, was awarded by Chile, after severe competition, to the Westinghouse Electric & Manufacturing Co., East Pittsburgh, Pennsylvania. The shipment was carried on thirty-two railroad cars and included two complete sub-station equipments for supplying power at 3,000 volts d. c.

PIRELLI SECURES WIRE CONTRACT

In the recent rehabilitation of the Theatre Royal, Drury Lane, London, England, the wires and cables used in the scheme of lighting were manufactured at the Pirelli general works at Southampton, England. The organization known as Pirelli has its main offices at Milan, Italy, maintaining factories in four cities of that country, while other plants are in operation in Spain, Argentina, and England.

Rubber Trade Inquiries

The inquiries that follow have already been answered; nevertheless they are of interest not only in showing the needs of the trade, but because of the possibility that additional information may be furnished by those who read them. The Editor is therefore glad to have those interested communicate with him.

- (35) The address of a manufacturer of toy footballs is desired.
- (36) A reader asks for addresses of concerns manufacturing vulcanized rubberized stockinette.
- (37) A manufacturer requests the addresses of concerns manufacturing a machine for numbering tires serially.
- (38) A manufacturer desires the addresses of concerns producing round aluminum ice cap stopples.
- (39) An inquiry has been received for the addresses of manufacturers of solid round rubber $1\frac{1}{4}$ to $1\frac{1}{2}$ inches in diameter in pieces 1 to 5 feet long.
- (40) A request has been made for the names of manufacturers of rubber quoits.
- (41) An inquirer desires the names of manufacturers of machinery for joining inner tubes.
- (42) A manufacturer desires addresses of concerns making rubber gloves.
- (43) A dealer requests the addresses of eastern concerns manufacturing in large quantities household specialties, as aprons, gloves, hot-water bottles, etc.
- (44) An inquiry has been received for the name of a manufacturer of unbranded golf balls.
- (45) The name of the maker of Red Rex is requested.
- (46) Request is made for the addresses of manufacturers of lasts for building and curing rubber work boots.
- (47) A manufacturer desires the addresses of concerns making flexible shaft tire buffers.
- (48) Addresses of New York concerns selling Panama block balata are desired.
- (49) Addresses of manufacturers of imitation leather are requested.
- (50) A manufacturer asks for the addresses of concerns making rubber band machinery.
- (51) Inquiry is made for the address of manufacturers of machines for painting rubber play balls.
- (52) The address of the manufacturer of the Palmer mill is desired.
- (53) The addresses of manufacturers of liquid rubber are requested.
- (54) A reader asks for a source of supply of tire buffings.

Foreign Trade Opportunities

Addresses and information concerning the inquiries listed below will be supplied to our readers through the Foreign Trade Bureau of The India Rubber World, 25 West 45th street, New York, N. Y. Request for each address should be on a separate sheet and state number.

- (2962) Commercial agent in Argentina desires to represent manufacturers of rubber in sheets and tubes, asbestos, belting, and chemicals.
- (3004) Mercantile firm in Italy desires to purchase and agency for machinery belting. Quote c.i.f. Leghorn or Genoa.
- (3022) Trading company in Mexico desires to represent exporters, and a manufacturer of low price rubber heels.
- (3063) Drug company in Canada desires to purchase rubber goods, including combs, atomizers, syringes, water-bottles, etc. Quote f. o. b. Canadian port. Cash.
- (3098) Mercantile firm in Czechoslovakia desires to purchase tires and solid tires. Quote c. i. f. German, French or Holland ports.

(3144) Commission agent in Chile desires to purchase or agency for dental supplies. Quote c. i. f. Talcahuano or f. o. b. New York.

(3163) Commercial agent from Dominican Republic desires to secure agency for chemicals and rubber goods. Quote c. i. f. Dominican ports.

(3202) Merchant in Tunisia desires to purchase and agency for rubber products. Quote c. i. f. Tunisia. Cash against documents.

(3223) Commercial agent in Italy desires to represent American manufacturers of clincher tires.

(3230) Agency firm in Cape of Good Hope Province desires to purchase and agency for fountain pens to sell at \$2 and less. Quote c. i. f. African port.

(3307) Merchant in Italy desires agency for imitation or artificial leather for automobiles and furniture. Correspond in French or Italian.

(3332) Manufacturer in Italy wishes to purchase and agency for elastic cord for dolls and rubber cement for attaching rubber soles.

Trade Lists Available

Mimeographed copies of a list of rubber goods importers and dealers in Colombia, South America, may be had upon request to the Foreign Trade Bureau of THE INDIA RUBBER WORLD. Please refer to file No. LA-14009-A.

UNITED STATES RUBBER EXPORTS, JANUARY-MAY, 1922

Comparing the figures of the United States rubber exports for the first five months of 1922 brings out some interesting facts. As the total exports for this period were \$14,264,931, the figures for the year at this rate should reach about \$32,000,000, which would be a little more than last year's figures.

Exports also for these five individual months of 1922 reached the highest point in March, when sales for that month totaled \$3,737,063. While April exports showed a considerable decline, some advantage was gained in May, although the figures were still somewhat below those of March.

In reviewing these statistics by products it will be noted that here also the March totals are higher than for those of other months, as in the case of pneumatic tires where the March total is \$1,907,647. England remains our best customer for these goods, taking, during the first four months of the year, tires valued at \$1,192,947, while Cuba, during February, March and April, stood second on the list, with an importation valued at \$299,833. Argentina, Quebec and Ontario, and Mexico, follow in the order named.

Exports of canvas shoes with rubber soles have advanced steadily, a decided increase appearing in April, when \$336,687 far surpass the high export figures of March, which were \$193,208. Another interesting fact regarding footwear exports is seen in the May figures of \$119,113 for boots and shoes, which outstripped the previous highest mark for the year—that of \$107,140 for February. Footwear exports to Japan in February, March and April led all other countries, with a total for the first four months of \$65,240. During the eleven months ended May, 1922, 210,943 pairs of rubber boots valued at \$530,890 were exported, as compared with 188,007 pairs valued at \$633,351 during the eleven months ended May, 1921, rubber boots being the only class of goods registering an increase either in quantity or value during the period. Exports of rubber boots to Japan were largely responsible for this increase.

Mechanical goods, including belting, hose, and packing, also show an encouraging advance in May, where the figures, \$247,105, represent an interesting recovery from the April decline, and even outstrip the March figures which were \$238,146. During these five months our best customers along the several lines of the rubber industry were England, Mexico, Cuba, Quebec and Ontario, Argentina, and Japan.

Review of the Crude Rubber Market

New York

EARLY in the month trade was at a minimum with very little factory buying and that mostly odd lots at prices below the market. Trade was interrupted on the 8th, due to a bank holiday in London and Singapore, and by the cutting of the cables in Ireland which isolated the New York market causing local dullness. Buying in the Far East by manufacturers held Singapore prices above those of London and New York, making trading very difficult, and the market fell off sharply.

The decline of New York spot prices in the first two weeks in August was from 14¾ to 14 cents a pound for ribbed smoked sheets. In the dull but steady market fluctuations of ½ to ¼-cent resulted in almost no trading. Some factories bought for spot, and October-December at 15 cents. Dealers' business was very limited as no profit was possible under the conditions leading to the reaction in London prices about the middle of the month. London stocks were reported at that time to be over 71,000 tons.

Parás have been dull and neglected the whole month. There has been nothing doing in other grades. In balata only small trading has been done while in pontianak and chicle the market is dead. In general, trade sentiment is pessimistic and the failure of the rubber manufacturing industry to purchase on the scale hoped for last spring has been a distinct disappointment.

The General Rubber Co. of New York, a subsidiary of the United States Rubber Co., has contracted to take the entire output of standard rubber of the Anglo-Dutch Plantations of Java from October 1, 1922, to the end of 1924, after providing for existing contracts. The rubber is deliverable on the estate, and the price is to be the average of the daily quotations for

London spot standard quality, calculated monthly, with minimum 8d., maximum 1s. 4d.; maximum and minimum to be increased by the amount of any export tax in existence at the time the price is calculated. The contract is automatically renewable for further periods of two years unless terminated by six months' notice by either party.

Importations of all grades during July were 22,245 tons compared with 11,692 tons for July one year ago. Plantation arrivals for July were 24,563 tons compared with 11,140 tons for July one year ago. Total importations of all grades for seven months ended July 31 were 155,603 tons as compared with 90,404 tons for the same period last year.

Spot and future quotations on standard plantation and Brazilian grades were as follows:

PLANTATIONS. AUGUST 1. Spot first latex crêpe, 14¼-14½ cents; August-September, 14½-14¾ cents; August-December, 14¾-15 cents; October-December, 15¾-15½ cents. AUGUST 25. Spot first latex crêpe, 13¾ cents; October-December, 14¾ cents; January-March, 14 cents.

AUGUST 1. Spot ribbed smoked sheets, 14¼-14½ cents; August-September, 14½-14¾ cents; August-December, 14¾-15 cents; October-December, 15¾-15½ cents. AUGUST 25. Spot ribbed smoked sheets, 13¾ cents; October-December, 14¾ cents; January-March, 14 cents.

AUGUST 1. Spot, No. 1 amber crêpe, 14-14½ cents; August-September, 14½-14¾ cents; August-December, 15 cents. AUGUST 25. Spot, No. 1 amber crêpe, 13¾ cents; October-December, 13¾ cents; January-March, 13¾ cents.

AUGUST 1. Spot, No. 1 rolled brown crêpe 11½-11¾ cents;

New York Quotations

Following are the New York spot quotations per pound, for one year, one month ago, and August 25, the current date:

Plantation Hevea

CREPE	September 1, 1921	August 1, 1922	August 25, 1922
First latex	\$0.14½ @	\$0.14¼ @.14½	\$0.13¾ @
Off latex .....	.13½ @	.14 @.14¼	.13¾ @
Amber No. 1 .....	.12½ @	.14 @.14¼	.13¾ @
Amber No. 2 .....	.11½ @	.13¾ @	.13¾ @
Amber No. 3 .....	.10½ @	.13½ @	.13¾ @
Brown, thick, thin, clean	.11 @	.13½ @	.13 @
Brown, specky .....	.10¼ @	.12¾ @.13	.12½ @
Brown, rolled .....	.10½ @	.11½ @.11¾	.11½ @

SHEET

Smoked, ribbed .....	.13¾ @	.14¼ @.14½	.13¾ @
Smoked, plain .....	.11½ @	.13 @	.13 @
Unsmoked	@	†.13 @	@
Colombo scrap No. 1	@	.11 @.11½	.10½ @
Colombo scrap No. 2	@	.09 @.09½	.09 @

East Indian

PONTIANAK

Banjermassin .....	.07½ @	.07¼ @	.07¾ @
Palembang .....	.08 @	.08¾ @	.08¼ @
Pressed block .....	.10 @.11	.12 @	.12 @
Sarawak .....	.06¾ @	.06 @	.06½ @

South American

PARAS

Upriver fine .....	.17¼ @	.19 @	.18½ @
Upriver fine*	@	*.28 @	*.29 @
Upriver medium .....	.14¼ @	.17 @	.16 @.17
Upriver coarse .....	.09¼ @	.13 @	.13¾ @
Upriver weak, fine .....	.13½ @	†.15 @	.15 @
Islands fine .....	.17 @	*.17½ @	*.16½ @.16¾
Islands fine*	@	*.27 @	*.28 @
Islands medium .....	.14 @	†.16 @	.15¼ @
Islands coarse .....	.07 @	.09½ @	.09 @
Cametá .....	.08 @	.09 @.10	.09½ @
Cametá*	@	*.19 @	*.19 @
Acre Bolivian fine .....	.17½ @	.18¾ @.19	.18¾ @
Acre Bolivian fine*	@	*.28 @	*.29 @
Beni Bolivian .....	.17¾ @	†.19 @	.18¾ @
Madeira fine .....	.22 @	.23 @	.19½ @.21
Peruvian fine .....	.17½ @	.17 @	.17½ @
Tapajos fine .....	.17 @	.17¼ @	.17¼ @.17½

Maniobas

CAUCHO	September 1, 1921	August 1, 1922	August 25, 1922
Upper cauchó ball	@	.13 @	.13 @.13¼
Upper cauchó ball*	@	*.18½ @	*.19 @
Lower cauchó ball	@	.11 @	.10¾ @.11¼
Ceará negro heads	†.10 @	.10 @	†.09 @
Ceará scrap	†.08 @	.05 @	†.05 @
Maniobá 30% guaranty	†.10 @	.09 @	†.07 @
Mangabeira, thin sheet	†.12 @	.12 @	†.11 @

Centrals

Central scrap .....	.08 @.11	.08 @.09	.10 @.11
Central scrap and strip .....	.07 @.09	.07 @.08	.07 @.08
Central wet sheet .....	.05 @	.06 @.08	.05 @.07
Corinto scrap .....	.08 @.11	.08 @.09	.10 @.11
Esmeralda sausage .....	.08 @.11	.08 @.09	.10 @.11
Guayule washed and dried .....	.25 @	.26 @	.26 @

Africans

Benguela, No. 1, 28½%	@	@	@
Benguela, No. 2, 32½% .....	.05 @	.08 @	.06 @
Congo prime, black upper	@	.14 @	.09 @.10
Congo prime, red upper	@	.12¼ @	.11 @
Kassai, black	@	.14 @	.10 @
red	@	.10 @.12	.09½ @

Gutta Percha

Gutta Siak .....	.15 @	.14¾ @	.14½ @.15
Red Macassar	2.50 @	2.75 @	2.75 @.3.90

Balata

Block, Ciudad Bolívar .....	.53 @	.50 @.51	.53 @
Colombia .....	.39 @	.45 @	.45 @
Panama .....	.25 @	.44 @	@
Surinam sheet .....	.64 @.65	.70 @	.68 @
amber .....	.68 @.69	.73 @	.72 @

Chicle

Colombia	@	.50 @	.50 @
Honduras	@	.70 @	.70 @.72
Venezuela	@	.70 @	.70 @.72
Yucatan fine	@	.75 @	.75 @

*Washed and dried crêpe. Shipment from Brazil.

†Nominal.

August-September, 11½-11¾ cents; August-December, 12-12½ cents. AUGUST 25. Spot, No. 1 rolled brown crêpe, 11½ cents; October-December, 11¾ cents; January-March, 11¾ cents.

SOUTH AMERICAN PARÁS AND CAUCHO. AUGUST 1. Spot, upriver fine, 19½ cents; islands fine, 17¼ cents; upriver coarse, 13 cents; islands coarse, 9½ cents; Cametá, 9-10 cents; caucho ball, 13 cents. AUGUST 25. Spot, upriver fine, 18½ cents; islands fine, 16½-16¾ cents; upriver coarse, 13½ cents; islands coarse, 9 cents; Cametá, 9¼ cents; caucho ball, 10¾-13 cents.

London

The market early in the month exhibited no activity, remaining dull and unchanged at 7½ to 7¾d. a pound until the reaction which noted a further decline of ¼d. a pound in all positions of standard sheets and crêpe. Spot stocks exceed 70,000 tons.

The half yearly trade report of Malaya mentions the interesting fact that exportation has been made of 355 gallons of rubber latex valued at \$1,286. This is the first time that latex has been included in trade returns.

Reclaimed Rubber

The demand for reclaim during the past month has been of a routine character and in volume about the same as a month ago. Reclaimers are still running below normal production, a condition to be expected until the crude rubber market assumes greater activity. The following prices are nominal and unchanged since July 1, 1922:

New York Quotations

August 25, 1922

Prices subject to change without notice

STANDARD RECLAIMS

Floating	\$0.12 @ \$0.13
Friction .....	.12 @ .13
Mechanical .....	.08 @ .10
Shoe .....	.10¼ @ .10¾
Tires, auto .....	.09 @ .10
Truck .....	.09 @ .10
White .....	.13 @ .14

Amsterdam Rubber Market

JOOSTEN & JANSSEN, Amsterdam, report, under date of August 4, 1922:

Nothing special can be reported about this week's market. Prices remained perfectly unchanged, nominal, and only a few transactions resulted.

Foreign markets were in the same position.
Hevea crêpe, Fl. 39½. Sheets, Fl. 40 spot.
Hevea crêpe, Fl. 42. Sheets, Fl. 42 October to December.
Hevea crêpe, Fl. 43½. Sheets, Fl. 43½ January to March.

Comparative Low and High New York Spot Rubber Prices

PLANTATIONS	August		
	1922*	1921	1920
First latex crêpe...	\$0.13¼ @ \$0.14¼	\$0.14¼ @ \$0.17	\$0.29¼ @ \$0.33¼
Smoked sheet, ribbed	.13¼ @ .14¼	.13¼ @ .15	.29¼ @ .33¼
PARAS			
Upriver, fine .....	.18¼ @ .19½	.17 @ .19½	.30 @ .35
Upriver, coarse .....	.13 @ .14	.08¼ @ .11½	.20 @ .27
Islands, fine .....	.17¼ @ .17¾	.16½ @ .18½	.29 @ .32
Islands, coarse .....	.08¼ @ .09½	.07 @ .08	.19 @ .20
Cametá .....	.08¼ @ .09½	.07½ @ .09	.18 @ .19

*Figured to August 25, 1922.

Singapore Rubber Market

GUTHRIE & CO., Limited, Singapore, reports, under date of July 20, 1922:

Since last reporting, the rubber market has been without feature, values remaining steady at 25 cents for sheet and crêpe. The weekly auctions held yesterday were well attended, all interests operating. Demand was good and values generally unchanged, but better prices were obtainable in the outside market and a large quantity was withdrawn.

Standard sheet was in demand at 25 cents, but only a few small lots changed hands at this figure. Good F. A. Q. sheet was steady at 24½ to 25 cents, but off lots were weaker. Pale and off crêpes declined slightly. Lower grades were a strong market. The sale closed steady with a tendency to higher values. Of 753 tons cataloged, 337 tons were sold.

The following is the course of values:

	In Singapore per Pound	Sterling Equivalent per Pound in London
Sheet, fine ribbed smoked.....	25	7½ @ 8
Sheet, good F. A. Q.	24½ @ 25	7¼ @ 7½
Sheet, off quality.....	22½ @ 24	7 @ 7¼
Crêpe, fine pale.....	24½ @ 25	8½ @ 8¾
Crêpe, good pale.....	23½ @ 24	8 @ 8¼
Crêpe, off quality.....	21 @ 23	7½ @ 8
Crêpe, fine brown.....	22 @ 22½	7½ @ 7¾
Crêpe, good brown.....	20 @ 21½	7 @ 7½
Crêpe, dark.....	16½ @ 21½	6½ @ 7½
Crêpe, bark.....	16 @ 19	6 @ 6½

Plantation Rubber Exports from Malaya

	January 1 to May 31, 1922			January 1 to July 13, 1922	
	Singapore Pounds	Malacca Pounds	Penang Pounds	Port Swettenham Pounds	Totals Pounds
To United Kingdom.....	2,695,000	6,027,200	2,187,600	8,940,757	19,850,557
The Continent.....	13,081,800	739,900	2,326,200	507,673	16,655,573
Japan	13,797,600	.....	56,000	.....	13,853,600
United States.....	149,321,500	16,437,500	14,465,900	1,981,538	182,206,438
British Possessions	3,614,900	.....	25,000	483,931	4,123,831
Other countries.....	246,300	.....	3,200	.....	249,500
Totals	182,757,100	23,204,600	19,063,900	11,913,899	236,939,499

New York Average Spot Rubber Prices

PRICES IN CENTS PER POUND

	July, 1922																				August, 1922				
PLANTATIONS	10	11	12	13	14	15	17	18	19	20	21	22	24	25	26	27	28	29	31	1	2	3	4	5	
Sheet																									
Ribbed smoked	14½	14½	14½	14½	14½	14½	14½	14½	14½	14½	14½	14½	14½	14½	14½	14½	14½	14½	14½	14½	14½	14½	14½	14½	
Crêpe																									
First latex	14½	14½	14½	14½	14½	14½	14½	14½	14½	14½	14½	14½	14½	14½	14½	14½	14½	14½	14½	14½	14½	14½	14½	14½	
Off latex	14½	14½	14½	14½	14½	14	14½	13½	14½	13½	14½	14½	14½	14½	14½	14½	14½	14½	14½	14½	14½	14	13½	13½	
No. 1 blanket	14½	14½	14½	14½	14½	14½	15	14½	14½	14½	14½	14½	14½	14½	14½	14½	14½	14½	14½	14½	14½	14½	14½	14½	
No. 2 blanket	14½	14	14½	13½	13½	13½	14½	13½	13½	13½	13½	13½	14½	14	13½	13½	14	14½	14½	13½	14	13½	13½	13½	
No. 3 blanket	13½	13½	13½	13½	13½	13½	13½	13½	13½	13½	13½	13½	13½	13½	13½	13½	13½	13½	13½	13½	13½	13½	13½	13½	
Thin, clean, brown	14½	13½	13½	13½	13½	13½	14	13½	13½	13½	13½	13½	13½	13½	13½	13½	13½	13½	13½	13½	13½	13½	13½	13½	
Speckly brown	13½	13	13	13½	13½	13½	13½	13	13½	13½	13½	12½	12½	13	13½	12½	13	13	12½	12½	12½	12½	12½	12½	
Rolled brown	11½	11½	11½	11½	11½	11½	11½	11½	11½	11½	11½	11½	11½	11½	11½	11½	11½	11½	11½	11½	11½	11½	11½	11½	

United States Crude and Waste Rubber Imports for 1922 (By Months)

	Plantations	Parás	Africans	Centrals	Guayule	Manicoba and Matto Grosso	Totals	Balata	Miscellaneous	Waste
January	20,774	916	161	16	.....	.....	21,867	14,177	42	85
February	27,370	1,347	301	14	.....	.....	28,973	8,641	28	6
March	27,711	451	326	3	54	57	28,702	14,416	17	61
April	13,910	462	5	2	65	.....	14,444	17,269	8	122
May	19,485	1,072	3	.....	62	.....	20,622	10,732	15	117
June	14,851	861	14	3	21	.....	15,750	13,477	12	23
July	24,563	575	102	2	3	.....	25,245	11,692	50	45
Totals, 7 months, 1922.....	148,564	5,684	912	40	281	122	155,603	.....	172	337
Totals, 7 months, 1921.....	82,462	7,097	716	68	58	3	90,404	273	1,200	1,607

Compiled by The Rubber Association of America, Inc.

Crude Rubber Arrivals at New York as Stated by Ships' Manifests

Parás and Caucho

	Fine	Medium	Coarse	Caucho	Totals		Fine	Medium	Coarse	Caucho	Totals
August 2. By "Dunstan," from Pará						L. Littlejohn & Co., Inc.	25,485				25,485
Paul Bertuch				98,371	98,371	Poel & Kelly, Inc.	134,800		5,000	11,531	151,331
General Rubber Co.	67,200				67,200	Schafer & Meyer	24,640			22,400	58,240
L. Littlejohn & Co., Inc.	50,716				50,716	August 14. By "Boswell," from Pará					
Poel & Kelly, Inc.	46,462			67,176	113,638	H. A. Astlett & Co.	33,600		40,320		73,920
August 11. By "Sallust," from Pará						Paul Bertuch	40,692	33,569	3,703	3,482	81,446
Paul Bertuch				96,244	96,244	General Rubber Co.					144,800
General Rubber Co.	105,280		6,720		112,000	L. Littlejohn & Co., Inc.	33,600				33,600
General Rubber Co.					167,200	Poel & Kelly, Inc.	22,400				22,400

Plantations

(Figured at 180 lbs. net to the bale or case.)

	Pounds	Totals		Pounds	Totals		Pounds	Totals
JULY 19. By "Menominee," London.			August 4. By "West Mahomet," Far East.			L. Littlejohn & Co., Inc.	1,803,200	
L. Littlejohn & Co., Inc.	300,691		Continental Rubber Co. of	89,600		Meyer & Brown, Inc.	434,560	
Various	26,549	327,240	N. Y.	112,000		H. Muehlstein & Co., Inc.	302,400	
JULY 19. By "President Van Buren," London.			Hood Rubber Co.	256,000		Poel & Kelly, Inc.	421,463	
Various	14,220	14,220	L. Littlejohn & Co., Inc.	561,240		Schafer & Meyer	67,200	
JULY 22. By "West Orowa," Far East.			H. Muehlstein & Co., Inc.	56,000		Fred Stern & Co., Inc.	29,120	
Poel & Kelly, Inc.	744,800		Poel & Kelly, Inc.	269,811		William H. Stiles & Co.	112,000	
Fred Stern & Co., Inc.	156,400		Fred Stern & Co., Inc.	108,614		Charles T. Wilson Co., Inc.	56,000	
Charles T. Wilson Co., Inc.	134,400	235,600	Charles T. Wilson Co., Inc.	100,800		Continental Rubber Co. of		
JULY 23. By "Oteric," Colombo.			Various	412,095	1,766,160	N. Y.	67,200	4,598,951
Continental Rubber Co. of			August 4. By "Sataria," Far East.			August 15. By "Noordam," Rotterdam.		
N. Y.	22,400		J. T. Johnstone & Co., Inc.	24,640		L. Littlejohn & Co., Inc.	448,000	
L. Littlejohn & Co., Inc.	280,000		Various	94,340	118,980	H. Muehlstein & Co., Inc.	22,400	470,400
Fred Stern & Co., Inc.	22,400		August 6. By "Deucalion," Far East.			August 15. By "Missouri," London.		
Various	268,660	593,460	Continental Rubber Co. of			L. Littlejohn & Co., Inc.	282,203	282,203
JULY 24. By "Port Alma," London.			N. Y.	44,800		August 15. By "Bradavon," London.		
L. Littlejohn & Co., Inc.	559,646		H. A. Astlett & Co.	257,600		H. Muehlstein & Co., Inc.	56,000	56,000
Various	79,714	639,360	Baird Rubber & Trading Co., Inc.	190,400		August 16. By "Lorenzo," Colombo.		
JULY 24. By "Virgilia," London.			General Rubber Co.	71,680		Baird Rubber & Trading Co., Inc.	22,400	22,400
Fred Stern & Co., Inc.	22,523		F. R. Henderson & Co., Inc.	380,344		August 17. By "Dunbar Maru," Japan.		
Various	697	23,220	Hood Rubber Co.	56,000		Mitsui & Co., Limited	22,400	22,400
JULY 24. By "Euryades," Far East.			J. T. Johnstone & Co., Inc.	2,426		August 17. By "Eastern Light," Singapore.		
Continental Rubber Co. of			L. Littlejohn & Co., Inc.	1,527,680		F. R. Henderson & Co., Inc.	230,000	230,000
N. Y.	11,200		Meyer & Brown, Inc.	349,440		August 18. By "Bolton Castle," Singapore.		
H. A. Astlett & Co.	454,700		H. Muehlstein & Co., Inc.	409,920		Baird Rubber & Trading Co., Inc.	33,600	
Baird Rubber & Trading Co., Inc.			Poel & Kelly, Inc.	633,480		F. R. Henderson & Co., Inc.	154,440	188,040
General Rubber Co.	168,000		Fred Stern & Co., Inc.	333,600				
F. R. Henderson & Co., Inc.	1,424,640		Charles T. Wilson Co., Inc.	136,163				
Hood Rubber Co.	224,000		Schafer & Meyer	224,000				
Hood Rubber Co.	33,600		William H. Stiles & Co.	11,200				
J. T. Johnstone & Co., Inc.	61,600		Various	174,306				
L. Littlejohn & Co., Inc.	2,665,600		Various	685,733	5,267,160			
Meyer & Brown, Inc.	369,600		August 6. By "Nieuw Amsterdam," Rotterdam.					
H. Muehlstein & Co., Inc.	414,400		L. Littlejohn & Co., Inc.	952,000				
Poel & Kelly, Inc.	678,065		H. Muehlstein & Co., Inc.	5,600				
Fred Stern & Co., Inc.	215,056		Various	103,960	1,061,560			
Fred Stern & Co., Inc.	222,400		August 7. By "Cedric," London.					
Charles T. Wilson Co., Inc.	128,800		Various	3,780	3,780			
Schafer & Meyer	44,800		August 8. By "Barbadian," London.					
William H. Stiles & Co.	156,800		L. Littlejohn & Co., Inc.	286,169				
Various	1,909,989		Meyer & Brown, Inc.	15,680	281,849			
Various	24,796	9,237,750	August 9. By "Valencia," London.					
JULY 25. By "Alaska Maru," Far East.			Baird Rubber & Trading Co., Inc.	190,400				
J. T. Johnstone & Co., Inc.	49,374		General Rubber Co.	896,000				
Poel & Kelly, Inc.	707,812		Meyer & Brown, Inc.	515,200				
Schafer & Meyer	112,000		H. Muehlstein & Co., Inc.	33,600				
Various	47,554	916,740	Various	126,980	1,605,780			
JULY 25. By "President Polk," London.			August 11. By "Diana Dollar," Far East.					
William H. Stiles & Co.	56,000	56,000	H. A. Astlett & Co.	78,400				
JULY 26. By "Mesaba," London.			General Rubber Co.	128,800				
Aldens' Successors, Inc.	40,111		Hood Rubber Co.	110,800				
L. Littlejohn & Co., Inc.	73,138		L. Littlejohn & Co., Inc.	612,720				
Various	109,411	222,660	H. Muehlstein & Co., Inc.	181,440				
JULY 29. By "Gaelic Prince," Far East.			Poel & Kelly, Inc.	22,650				
H. A. Astlett & Co.	470,400		Schafer & Meyer	33,600				
General Rubber Co.	56,000		Fred Stern & Co., Inc.	17,285				
F. R. Henderson & Co., Inc.	112,000		William H. Stiles & Co.	8,960				
Hood Rubber Co.	44,800		Charles T. Wilson Co., Inc.	61,500				
J. T. Johnstone & Co., Inc.	44,253		Continental Rubber Co. of					
L. Littlejohn & Co., Inc.	1,014,720		N. Y.	56,000	1,323,355			
Meyer & Brown, Inc.	67,200		August 11. By "Bawean," Far East.					
H. Muehlstein & Co., Inc.	176,960		Baird Rubber & Trading Co., Inc.	248,100				
Poel & Kelly, Inc.	649,800		General Rubber Co.	316,342				
Fred Stern & Co., Inc.	151,350		F. R. Henderson & Co., Inc.	23,068				
Charles T. Wilson Co., Inc.	100,800		J. T. Johnstone & Co., Inc.	12,343				
Schafer & Meyer	67,200		L. Littlejohn & Co., Inc.	687,680				
William H. Stiles & Co.	302,400		H. Muehlstein & Co., Inc.	44,800				
Various	112,620	4,958,640	Poel & Kelly, Inc.	114,042				
JULY 30. By "Venomina," London.			Fred Stern & Co., Inc.	129,184				
L. Littlejohn & Co., Inc.	33,600	33,600	William H. Stiles & Co.	16,800				
JULY 30. By "Baltic," Far East.			Charles T. Wilson Co., Inc.	67,200				
Poel & Kelly, Inc.	11,253	11,253	Continental Rubber Co. of					
JULY 31. By "Saxonia," London.			N. Y.	44,800	1,704,359			
Various	95,940	95,940	August 11. By "West Choepka," Singapore.					
JULY 31. By "Westerdijk," Far East.			Baird Rubber & Trading Co., Inc.	156,000	56,000			
L. Littlejohn & Co., Inc.	201,600		August 13. By "Alcinous," Far East.					
Various	6,480	208,080	H. A. Astlett & Co.	112,000				
August 3. By "Bradford City," London.			Baird Rubber & Trading Co., Inc.	33,600				
Various	180	180	General Rubber Co.	791,418				
			F. R. Henderson & Co., Inc.	222,800				
			Hood Rubber Co.	114,990				

†Arrived at Boston.
‡Arrived at Los Angeles.
*Arrived at San Francisco.

Rubber Latex

August 4. By "West Mahomet," Belawan.
Holl. Com. Plant. Co. 150 bbls. 127,005 lbs.
To order 16,000 gal. 132,800 lbs.

Africans

JULY 30. By "Baltic," Liverpool.
Fred Stern & Co., Inc. 22,214 22,214

Centrals

JULY 30. By "Mincola," Balboa.
Various 4,200 4,200

Pontianak

JULY 24. By "Euryades," Singapore.
L. Littlejohn & Co., Inc. 2,000
Various 13,400 15,400
JULY 29. By "Gaelic Prince," Singapore.
L. Littlejohn & Co., Inc. 67,000
Various 10,200 77,200

Gutta Siak

JULY 24. By "Euryades," Singapore.
L. Littlejohn & Co., Inc. 56,000
Fred Stern & Co., Inc. 45,371 101,371
August 6. By "Deucalion," Singapore.
Fred Stern & Co., Inc. 11,200
Various 5,600 16,800
August 11. By "Diana Dollar," Singapore.
Fred Stern & Co., Inc. 11,200 11,200
August 14. By "Alcinous," Far East.
L. Littlejohn & Co., Inc. 112,000 112,000

Gutta Percha

JULY 24. By "Euryades," Singapore.
Various 51,900 51,900

Balata

JULY 19. By "Matura," Trinidad.
Various 23,040 23,040
JULY 20. By "Sizolia," Cristobal.
Various 2,550 2,550
JULY 23. By "Paria," Paramaribo.
William Schall & Co. 6,450 6,450
JULY 31. By "Mincola," Buenaventura.
Ultramarine Corporation 5,400 5,400
August 2. By "Dunstan," Pará.
Various 150 150
August 6. By "Nickerie," Port au Prince.
Various 4,350 4,350
August 6. By "General W. C. Gorgas," Cristobal.
Various 3,300 3,300
August 6. By "Cedric," Liverpool.
Various 4,560 4,560
August 6. By "W. M. Tupper," Paramaribo.
Various 27,750 27,750

Exports of India Rubber Manufactures from the

EXPORTED TO—	Belting Value	Hose Value	Packing Value	Thread Value	Boots		Shoes		Canvas Shoes with Rubber Soles		Soles and Heels Value	Leather Cloth or Artificial Leather Value	Water-proofed and Auto Topping Value
					Pairs	Value	Pairs	Value	Pairs	Value			
EUROPE													
Azores and Madeira Islands.....													
Belgium.....	\$789	\$931	\$287	\$2,763								\$307	\$1,300
Czechoslovakia.....			471		190	\$577	3,613	\$6,257	1,582	\$1,548		4,610	806
Denmark.....			260										
Estonia.....	335											163	
Finland.....			187	17,841					1,136	843		40,971	
France.....	480	413											
Germany.....													
Gibraltar.....													
Greece.....													
Iceland and Faroe Islands.....				2,967	8,504	253	447						
Italy.....				10,539	366	1,145					\$583	1,682	1,141
Jugoslavia, Albania, etc.....													
Latvia.....													
Malta, Gozo, and Cyprus Islands.....													
Netherlands.....	9,653	2,202							474	367	1,000	402	965
Norway.....	3,408	188			368	1,137	222	578	10,029	6,445	213	3,962	3,361
Poland and Danzig.....		624	24										
Portugal.....											169	34	
Rumania.....		275	291										
Spain.....		28		4,500									
Sweden.....	1,007	621	94									10,225	
Switzerland.....												297	
Turkey in Europe.....												140	
Ukraine.....													
England.....	781	31,333	2,076	56,605	359	1,673	2,265	2,744	7,049	4,865	3,021	13,838	4,577
Scotland.....	139	62	85		132	335	864	366				1,685	886
Ireland.....													
TOTALS, EUROPE.....	\$16,592	\$36,677	\$3,775	\$92,248	4,382	\$13,371	7,217	\$10,392	20,270	\$14,068	\$4,986	\$78,316	\$13,036
NORTH AMERICA													
Canada—Maritime Provinces.....	\$1,985	\$1,122	\$89		567	\$1,823			396	\$413		\$876	\$138
Quebec and Ontario.....	4,731	14,489	4,724	\$5,132	197	312	345	\$381	1,393	2,058	\$499	17,725	14,676
Prairie Provinces.....	4	348	182	47					6	6		271	556
Brit. Columbia and Yukon.....	611	1,837	76		197	777	40	56				495	34
British Honduras.....							27	23	233	374	87		
Costa Rica.....	127	1,457							192	181	1,161	209	160
Guatemala.....	210	2	65						588	579	740	103	155
Honduras.....	126	2,403	381						1,117	1,217	642		
Nicaragua.....		41							222	237	685		337
Panama.....	290	889	462				76	58	5,826	4,185	457		75
Salvador.....	44	35	71						673	601	3,664	43	
Mexico.....	17,002	24,716	6,198	251	22	112	41,159	17,055	16,406	14,002	20,256	2,941	1,723
Miquelon and St. Pierre Islands.....					456	1,432							
Newfoundland and Labrador.....	648	350	183		4,602	11,847	288	379	462	404	580	59	
Bermuda.....		231	31		4	11			252	190	106		15
Barbados.....	150	15					60	70	326	327			829
Jamaica.....	108	258	5						5,758	5,082	14	384	625
Trinidad and Tobago.....	26	102	93				447	449	1,306	1,018	25		130
Other British West Indies.....		198	38						3,344	3,218	452	62	130
Cuba.....	869	6,241	3,417				1,493	1,077	63,569	42,360	8,570	4,578	13,885
Dominican Republic.....	130	452	191				912	659	1,322	1,401	180	55	
Dutch West Indies.....			21						1,887	1,367	116		
French West Indies.....	35								72	76			276
Haiti.....	73	63					24	19	96	181	149		148
Virgin Islands of United States.....			60						204	176	115		
TOTALS NORTH AMERICA.....	\$27,171	\$55,249	\$16,287	\$5,430	6,045	\$16,314	44,871	\$20,226	105,650	\$79,653	\$38,498	\$27,801	\$33,892
SOUTH AMERICA													
Argentina.....	\$1,332	\$1,953	\$116		24	\$105			44,325	\$30,174	\$640	\$7,470	\$10,332
Bolivia.....													
Brazil.....	5,821	2,122	249		324	2,301			72	183		2,566	2,728
Chile.....	3,161	52	361									637	1,761
Colombia.....	224	688	194				264	\$204	5,443	4,844	4,981	1,540	552
Ecuador.....		568	262				162	116	6,593	4,997	433		148
British Guiana.....	150								88	74		37	199
Dutch Guiana.....									240	233		52	101
French Guiana.....											4		
Peru.....	436	107	1,026										
Uruguay.....		159							1,092	970	1,304	1,865	470
Venezuela.....	80	258	1,855	\$123							598	2,040	
TOTALS, SOUTH AMERICA.....	\$11,204	\$5,907	\$4,063	\$123	348	\$2,406	426	\$320	57,889	\$41,509	\$7,960	\$16,207	\$16,489
OCEANIA													
Philippine Islands.....	\$5,275	\$2,074	\$1,889						119,334	\$86,744	\$6,893	\$964	\$2,830
Australia.....	698	1,799	2,288				8	\$14				18,796	4,689
British Oceania.....									33	40			
French Oceania.....							108	167	1,125	1,338			64
New Zealand.....	120	682	721		294	\$1,125					70	764	1,309
TOTALS, OCEANIA.....	\$6,093	\$4,555	\$4,898		294	\$1,125	116	\$181	120,492	\$88,122	\$6,963	\$20,524	\$8,892
ASIA													
British India.....	\$1,781	\$1,875	\$254						276	\$309	\$26	\$1,056	\$82
Ceylon.....									207	342			
Straits Settlements.....									528	320			
Other British East Indies.....							144	\$122					
China.....	1,780	2,019	1,412		157	\$486	2,438	2,426			95	1,546	1,397
Chosen.....	1,478	41	116				120	96					
Java and Madura.....	1,150	134							120	143		1,058	283
Other Dutch East Indies.....	298												
Far Eastern Republic.....													
French Indo-China.....	3,718		148										
Greece in Asia.....													
Hejaz, Arabia, etc.....	66												
Hongkong.....		40	216				72	120	696	742			
Japan.....	66	1,135	5,325	\$14,359	13,944	33,575	13,641	12,263	336	208		3,085	688
Palestine and Syria.....							8	7					
Persia.....			82										
Siam.....									192	174			
TOTALS, ASIA.....	\$12,337	\$5,244	\$7,553	\$14,359	14,101	\$34,055	16,423	\$15,034	2,355	\$2,238	\$121	\$6,745	\$2,450

Hard Rubber Goods

Water-proofed Clothing Value	Pneumatic Casings			Solid Tires		Pneumatic Tubes			Tire Repair Materials Value	Druggists' Rubber Sundries Value	Battery Jars and Accessories Value	Other Electrical Supplies Value	Others Value	All Other Rubber Manufactures Value	Totals Value
	Automobile		Others Value	Automobile Value	Others Value	Automobile		Others Value							
	Number	Value				Number	Value								
12	364					557	1,340	153	\$592	\$2,478				\$17	\$364
1,342	16,705	\$910													28,572
206	4,809					2,386	4,371	501	973	4,920			\$30	534	4,809
4,092	61,187	1,451	\$2,118			2	6								90,354
17	500					203	498		18					357	500
693	8,906					81	160	31	224	2,397	\$2,357		8,158	3,430	10,537
932	10,058	92							10						2,046
140	2,005														225
30	225														18,913
\$10	1,082	17,015				783	1,586		216	68					1,571
157	2,200					82	255		210					140	34,351
792	15,948	2,853				4	16	20	1676						721
28	605					6	16								1,676
															2,692
248	2,592					60	100		236	919			89	2,668	54,244
80	1,809	30,873	1,839	643		1,047	2,128	180	462	543				841	101,581
	3,801	69,140	367	1,975		4,227	8,810	151							648
														1,152	1,355
															3,324
50	1,262					250	1,467		29						101,701
5,376	71,176					1,324	2,535	15	1,098	152					1,900
6,793	134,971	800	1,089			2,819	7,068	245	625					610	148,420
143	2,838	501				41	95	100		231					4,947
366	3,903			434		224	470								203
15	203														556,214
29,667	279,339	20,027	17,063			10,687	17,267	1,829	3,850	28,141	3,857		13,613	49,715	527
981	311	3,723	1,028			125	223	127		475				192	10,642
	1,280	10,186				1,483	2,092								12,470
\$1,071	59,382	\$753,798	\$29,934	\$31,802		26,391	\$50,503	\$3,360	\$8,433	\$42,000	\$6,214		\$21,890	\$62,911	\$1,295,377
\$480	128	\$1,563	\$31			11	\$27		\$185	\$63			\$77	\$2,773	\$11,645
1,895	6,189	91,546	397	\$13,087	\$36	5,463	11,137	\$20	4,364	8,976	\$3,067	\$2,818	9,357	71,096	282,523
312	84	7,092		602	19	82	183		196	1,598	285	127	406	6,071	12,305
465	40	794		1,282	2	35	113		94	637		249	1,563	4,468	13,553
200	8	150								3					837
190	194	3,083		107	335	118			63	2			53	93	7,776
	56	1,605		401		84	283		42					200	4,385
18	79	1,232	19	2,705		8	70		8	118			53	545	9,537
	27	595		61		32	87		2	16			30	31	1,222
147	434	6,126	64	1,711	141	757	1,082	109	123	288			35	197	17,203
8,123	7,626	94,365	894	4,193	564	71	173	8	1					163	6,623
1,697															241,659
1,691	131	1,913		30		72	132		26					52	3,181
84				372					183					41	1,264
									247					60	3,676
161	1,850					98	128			120				429	24,225
43	953	14,256	10	1,356		751	1,533	2		34				414	3,953
	61	862	24			373	747		29					2	5,828
61	72	845	77	493		9	57	152	21	70					2
11,937	10,572	128,461	286	15,946	550	9,026	16,618	214	1,850	3,946	609	50	118	7,691	269,273
	1,308	19,270	574	3,721	196	1,864	4,129	46	115	282			31	555	31,987
	105	1,320				205	376							21	3,221
	289	3,478		321		182	228							27	4,454
	121	1,968		328		158	315		7					150	3,403
48	612		23			64	119		2					52	1,159
\$27,343	28,756	\$378,756	\$2,424	\$46,016	\$2,577	26,734	\$51,000	\$456	\$8,535	\$18,787	\$4,523	\$3,344	\$12,844	\$108,682	\$986,008
\$182	3,594	\$29,551		\$449	\$1,312	3,078	\$5,799	\$1,257	\$2,275	\$2,754				\$7,974	\$103,675
63	81	1,356				80	155			780			\$29	\$2,550	76
	1,691	18,389				12	2,185	3,122					310	1,673	64,890
	1,122	19,773		2,018	2,762	699	1,969		727	180				502	34,213
405	444	7,411	\$75	125	2,669	393	1,147		608	511				566	26,744
	210	4,508		41		136	292		64					94	11,523
	72	719	10	126		36	59							100	1,474
79	3	41												157	663
															4
	1,218	17,660		262		827	2,034		50	75			150	614	22,655
	1,434	19,922		159		418	630		1,074	728				676	27,957
	978	13,280		142		699	1,259		58	423		16	177	461	20,770
\$729	10,847	\$132,610	\$85	\$25,498	\$6,881	8,551	\$16,475	\$1,257	\$4,856	\$5,451		\$355	\$2,877	\$12,893	\$316,155
\$8,710	3,667	\$46,890	\$644	\$6,017	\$16,055	3,959	\$8,176	\$490	\$3,129	\$1,546			\$57	\$3,611	\$201,993
283	6,038	103,413	1,468	14,397	1,116	2,987	5,943	250	1,573	3,023	\$60		486	1,842	\$16,687
	14	213		37		28	51								341
	36	631	67	352	75	26	85		32						2,811
	3,983	50,204		1,046		842	1,624		3,966	1,500	1,686			1,718	66,535
\$8,993	13,738	\$201,341	\$1,179	\$21,849	\$17,246	7,842	\$15,879	\$749	\$8,700	\$6,069	\$1,746		\$543	\$7,171	\$433,818
	254	\$3,173	\$15	\$2,319	\$195	111	\$286		\$85	\$23				\$198	\$11,677
	4	94				4	10							43	489
	856	11,690		420		345	986			62					122
	220	3,477	134			466	700		404	2,194				439	18,803
	76	800				150	250					\$300			2,781
	3,973	46,135	1,423	5,127	1,218	2,699	6,950	\$278	395					607	64,901
	282	2,311	280	2,590		307	749	120	2	100					6,450
	44	779				50	132			917		5,938			7,766
										177				8	6,051
	1	27													6,233
	386	5,239				326	928							52	1,656
	8	134		343		4	9								87,215
	58	11,379	73	1,401		28	265		2,055						2,954
\$5	101	1,684				162	1,040		218						82
															1,370
	74	1,079				60	90		27						
55	6,803	\$83,001	\$1,925	\$12,200	\$1,413	4,712	\$12,395	\$398	\$3,186	\$3,473		\$6,238		\$2,685	\$232,055

Exports of India Rubber Manufactures from the United

	Beltling Value	Hose Value	Packing Value	Thread Value	Boots		Shoes		Canvas Shoes with Rubber Soles		Soles and Heels Value	Leather Cloth or Artificial Leather Value	Water-proofed and Auto Cloth and Auto Topping Value
					Pairs	Value	Pairs	Value	Pairs	Value			
AFRICA													
British West Africa.....	\$56								24	\$40		\$132	
British South Africa.....	8,960	\$17,806	\$2,463				100	\$230	2,064	2,356	\$811	5,515	\$1,890
British East Africa.....													
Canary Islands.....													
Egypt.....													
Other French Africa.....													
Morocco.....													76
Portuguese East Africa.....		18	766										
Other Portuguese Africa.....													
Spanish Africa.....													
TOTALS, AFRICA.....	\$9,016	\$17,824	\$3,229				100	\$230	2,088	\$2,396	\$811	\$5,647	\$1,966
GRAND TOTALS.....	\$82,413	\$125,456	\$39,805	\$112,160	25,170	\$67,271	69,153	\$46,383	308,744	\$227,986	\$59,339	\$155,240	\$76,725

Compiled by the Bureau of Foreign Commerce, Department of Commerce, Washington, D. C.

Custom House Statistics

New York

Imports

	June 1921		June 1922	
	Pounds	Value	Pounds	Value
UNMANUFACTURED—free				
Crude rubber				
From Belgium.....	49,595	\$1,075	11,209	\$1,653
France.....			25	5
Netherlands.....	941,378	174,884	417,991	57,387
England.....	1,357,917	211,549	1,656,820	270,075
Nicaragua.....			215	54
Salvador.....			3,660	750
Newfoundland.....			250	50
Brazil.....	2,215,989	242,286	1,646,065	195,793
Colombia.....	366,712	41,315	4,553	630
Ecuador.....	42,524	5,552		
Peru.....	22,594	2,431	330	40
Uruguay.....			47,157	6,838
China.....	50,957	11,624	30,000	3,200
British India.....	487,050	63,656	32,662	5,165
Ceylon.....			12,747,521	1,907,298
Straits Settlements.....	21,910,519	3,887,366	26,619,852	3,752,319
British East Indies.....	2,377,632	293,920		
Dutch East Indies.....	3,616,981	665,050	2,736,402	440,511
Philippine Islands.....	39,558	5,000	2,216,162	375,303
Java.....			40,690	6,104
Hongkong.....				
Totals.....	33,479,406	\$5,605,708	48,211,564	\$7,023,176
Balata.....	124,832	72,661	137,242	86,256
Jelutong (Pontianak).....	249,236	11,541	557,282	51,183
Gutta percha.....	196,231	25,156	298,778	46,107
Totals.....	34,049,705	\$5,715,066	49,204,866	\$7,206,722
Rubber, scrap and reclaimed.....	149,925	2,167	35,080	2,147
Totals, unmanufactured.....	34,199,630	\$5,717,233	49,239,946	\$7,208,869
MANUFACTURED				
Manufactures of rubber and gutta percha.....dutyable		\$49,693		\$129,452
Rubber substitutes.....dutyable			5,201	697
Chicle.....dutyable	132,021	65,295	163,723	97,492

Exports

MANUFACTURED				
Rubber, scrap and reclaimed.....			584,959	\$23,683
Automobile and other tires.....				
Inner tubes.....number		\$640,719	168,222	1,444,631
Tire repair materials.....		34,578	64,044	124,878
Boots and shoes.....pairs			53,874	25,094
Canvas shoes with rubber soles.....pairs		44,678	57,355	73,375
Soles and heels.....			125,293	91,368
Battery jars and accessories.....		20,911	100,183	45,517
Other electrical supplies.....			19,473	4,712
Other hard rubber goods.....			13,759	6,892
Druggists' rubber sundries.....			24,835	25,558
Belting, hose and packing.....		30,812	51,053	60,251
Thread.....		113,775	303,347	127,933
Other rubber manufactures.....			59,663	73,939
Totals, manufactured.....		\$1,131,837		\$2,226,651

Foreign Exports

Crude rubber.....	3,154	\$501	52,503	\$6,135
Balata.....	4,396	2,506	12,000	6,600
Gutta percha.....				
Rubber, scrap and reclaimed.....	224,283	31,400		
Rubber manufactures.....				
Chicle.....				

Rubber Statistics for France

Imports of Crude and Manufactured Rubber

	Year Ended December 1920		Year Ended December 1921	
	Quintals*	Francs†	Quintals	Francs
UNMANUFACTURED				
Crude rubber and gutta percha				
From Brazil.....	15,119		29,222	
England.....	151,624		84,286	
French Congo.....	4,970		2,345	
Senegal.....	784			
Other French Africa.....	6,515	285,803,000	201	150,991,000
British Indies.....	29,396		17,380	
Other countries.....	58,898		50,913	
Totals.....	267,306	285,803,000	190,646	150,991,000
MANUFACTURED				
Rubber sheets, unvulcanized.....	12,509	37,216,000	795	2,385,000
Rubber thread.....	2,374	10,090,000	1,674	6,026,000
Elastic fabrics.....	692	12,110,000	279	1,116,000
Rubberized fabric.....	5,729	57,290,000	294	1,176,000
Rubberized fabric articles.....	22	264,000	1	6,000
Garment protectors.....	19	323,000	12	64,000
Suspenders, garters, belts.....	39	663,000	36	191,000
Clothing.....	768	11,520,000	200	1,359,000
Fabrics for card clothing.....	329	1,152,000	233	489,000
Rubber footwear.....	4,471	12,966,000	1,490	2,682,000
Tires, tubes, solid tires.....	49,056	196,224,000	10,571	28,542,000
Belting, hose, packing.....	20,112	46,258,000	10,758	16,137,000
Totals, manufactured.....	96,122	397,076,000	26,343	60,173,000

Exports of Crude and Manufactured Rubber

	Year Ended December 1920		Year Ended December 1921	
	Quintals*	Francs†	Quintals	Francs
UNMANUFACTURED				
Crude rubber and gutta percha				
To England.....	27,691		2,727	
United States.....	24,415		5,022	
Germany.....	17,533	114,398,000	2,029	31,686,000
Other countries.....	37,355		30,230	
Totals.....	106,994	114,398,000	40,008	31,686,000
MANUFACTURED				
Rubber sheets, not vulcanized, and threads, vulcanized.....	713	2,121,000	348	887,000
Elastic fabric articles.....	1,149	18,563,000	657	2,345,000
Rubberized fabric in pieces.....	2,705	25,289,000	1,943	6,937,000
Card clothing.....	2,517	8,528,000	1,173	2,426,000
Clothing.....	5,040	70,686,000	4,231	24,455,000
Rubberized fabric articles.....	397	4,448,000	229	1,226,000
Footwear.....	15,478	43,415,000	45,325	77,053,000
Tires and tubes:				
To England.....	29,039		35,715	
Germany.....	4,530		700	
Belgium.....	14,388	528,911,000	12,580	357,722,000
Switzerland.....	10,039		7,562	
Other countries.....	84,824		83,726	
Belting, hose, packing.....	21,144	44,930,000	17,008	24,577,000
Totals.....	191,963	746,891,000	181,197	497,628,000

*Quintal equals 220.42 pounds. †Normal value of a franc is \$0.193.

States by Countries During May, 1922—Continued

Water-proofed Clothing Value	Pneumatic Casings						Pneumatic Tubes			Hard Rubber Goods							All Other Rubber Manufactures Totals Value
	Automobile		Others Value	Solid Tires		Automobile		Others Value	Tire Repair Materials Value	Druggists' Rubber Sundries Value	Battery Jars and Accessories Value	Other Electrical Supplies Value	Others Value				
	Number	Value		Automobile Value	Others Value	Number	Value										
\$1,653	474	\$7,451	\$829			685	\$1,890		\$75							\$10,473	
	3,785	43,507	1,062	\$1,115		1,675	2,367	\$1,065	3,674	\$536					\$2,920	97,830	
	280	3,141				32	65									3,206	
	563	6,959				297	538		169							7,616	
	473	5,484	525	401	\$116	113	259	245	22						600	7,652	
	8	709	48													257	
				717											21	814	
	168	4,560				328	746									784	
	76	1,034		3,667		10	25		53						60	5,306	
																4,849	
\$1,653	5,827	\$72,355	\$2,464	\$5,900	\$116	3,140	\$6,390	\$1,310	\$3,343	\$536					\$3,601	\$138,787	
\$39,794	125,353	\$1,626,861	\$35,011	\$143,265	\$28,233	77,370	\$152,642	\$7,530	\$37,053	\$76,316	\$12,483	\$10,137	\$38,154	\$197,943		\$3,402,200	

Pará Exports of India Rubber and Caucho from January to June, Inclusive, 1922

EXPORTERS	Europe					New York					Grand Totals
	Fine	Medium	Coarse	Caucho	Totals	Fine	Medium	Coarse	Caucho	Totals	
Berringer & Co. kilos	482,271	33,412	29,676	361,364	906,724	187,970	16,996	182,434	20,981	408,381	1,315,104
Bitar, Irmãos	452,434	7,247	10,927	524,463	995,071	83,039	25,160	20,952	52,190	181,341	1,176,412
General Rubber Co. of Brazil	56,100	7,135	16,205	89,760	169,209	35,263	40,317	243,877	343,918	983,375	1,152,575
Suarez, Filho & Co.	296,816	2,064	984	20,653	320,517	558,943	19,617	1,406	163,082	743,048	1,063,565
José Origel & Co.	343,994	25,787	16,278	20,801	406,860	.....	.....	.....	.....	.....	406,860
Ranniger & Co.	62,771	5,647	5,285	21,150	94,853	11,599	1,635	99,919	17,613	150,676	245,529
F. Chamé	1,050	.....	.....	.....	1,050	44,160	.....	108,563	16,300	169,043	170,093
Ferreira Costa & Co. ....	.....	.....	.....	.....	.....	85,860	6,370	5,850	33,280	131,360	131,360
Amazon River S. N. Co.	69,034	2,512	16,144	42,261	129,951	.....	.....	.....	.....	.....	129,951
Stowell & Co. ....	.....	.....	.....	.....	.....	38,638	1,530	21,685	27,323	89,176	89,176
Adelbert H. Alden, Limited.	28,297	1,863	.....	.....	30,160	.....	.....	.....	.....	.....	30,160
Wilson Holgate & Co.	26,848	.....	.....	.....	26,848	.....	.....	.....	.....	.....	26,848
Benchimol & Irmãos	12,070	.....	.....	.....	12,070	.....	.....	.....	.....	.....	12,070
S. Marques & Co. ....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
J. R. da Silva Fantes .....	.....	.....	.....	.....	.....	1,392	.....	4,680	.....	6,072	6,072
Pires Guerreiro & Co.	960	.....	.....	.....	960	2,147	.....	75	.....	2,222	2,222
Totals	1,832,645	85,667	95,499	1,080,452	3,094,263	1,388,941	111,625	689,441	674,787	2,864,694	5,958,957

Destinations

From Pará	New York	Havre	Hamburg	Liverpool	Brazil	Italy	Amsterdam	Buenos Aires	Leixões	Chile	Total
..... kilos	2,769,144	2,106,056	523,626	409,381	84,605	43,890	10,350	10,240	960	705	5,958,957

Compiled by Berringer & Co., Pará, Brazil.

Rubber Statistics for the Dominion of Canada

Imports of Crude and Manufactured Rubber

	May			
	1921		1922	
	Pounds	Value	Pounds	Value
UNMANUFACTURED—free				
Rubber, gutta percha, etc.				
From United Kingdom	200	\$90	54,843	\$8,630
United States	764,990	132,854	789,077	124,277
Belgium .....	.....	.....	.....	.....
Brazil .....	.....	.....	.....	.....
British East Indies .....	.....	.....	.....	.....
India	11,220	2,215	.....	.....
Ceylon .....	.....	.....	.....	.....
Straits Settlements	604,393	130,967	778,400	136,057
Dutch East Indies .....	.....	.....	125,813	21,391
Totals	1,380,803	\$266,126	1,748,133	\$290,355
Rubber, recovered	144,990	\$16,311	192,288	\$17,646
Rubber, powdered, and rubber or gutta percha scrap	104,952	2,522	184,563	7,560
Balata .....	.....	.....	23,024	3,598
Rubber substitutes	28,183	7,234	16,450	2,248
Totals, unmanufactured	1,658,928	\$292,193	2,164,458	\$321,407
PARTLY MANUFACTURED				
Hard rubber sheets and rods	598	\$641	2,162	\$1,597
Hard rubber tubes .....	.....	2,589	.....	2,517
Rubber thread, not covered	2,909	3,380	8,601	12,322
Totals, partly manufactured	3,507	\$6,610	10,763	\$16,436
MANUFACTURED				
Belting .....	.....	\$3,853	.....	\$14,739
Hose .....	.....	5,102	.....	10,918
Packing .....	.....	3,663	.....	4,645
Boots and shoes .....	.....	5,598	1,010	3,674
Clothing, including waterproofed .....	.....	10,359	.....	11,822
Gloves .....	.....	1,285	.....	937
Hot-water bottles .....	.....	273	.....	552
Tires, solid .....	.....	7,881	.....	20,120

	May			
	1921		1922	
	Pounds	Value	Pounds	Value
MANUFACTURED				
Tires, pneumatics .....	.....	122,371	.....	116,814
Inner tubes .....	.....	9,586	.....	16,344
Elastic, round or flat .....	.....	22,514	.....	32,742
Mats and matting .....	.....	1,652	.....	47
Cement .....	.....	2,324	.....	4,900
Other rubber manufactures .....	.....	113,309	.....	143,138
Totals, manufactured .....	.....	\$309,770	.....	\$381,392
Totals, rubber imports	1,662,435	\$608,573	2,175,221	\$719,235

Exports of Domestic and Foreign Rubber Goods

	May			
	1921		1922	
	Produce of Canada Value	Reexports of Foreign Goods Value	Produce of Canada Value	Reexports of Foreign Goods Value
UNMANUFACTURED				
Crude and waste rubber	\$9,334	\$95,072	\$2,564	.....
MANUFACTURED				
Belting .....	.....	\$379	.....	\$3,480
Canvas shoes with rubber soles .....	.....	21,786	.....	55,142
Boots and shoes .....	.....	14,542	.....	15,929
Clothing, including waterproofed .....	.....	8,916	.....	164
Hose .....	.....	38,225	.....	10,924
Tires, casings .....	.....	.....	.....	355,506
inner tubes .....	.....	.....	.....	30,334
pneumatic .....	.....	266,592	.....	.....
solid .....	.....	4,360	.....	6,906
vehicle .....	.....	12,629	.....	\$580
Other rubber manufactures	19,174	2,204	16,214	4,207
Totals, manufactured	\$373,974	\$14,833	\$494,599	\$4,787
Totals, rubber exports	\$383,308	\$109,905	\$497,163	\$4,787

United Kingdom Rubber Statistics

Imports

	June			
	1921		1922	
	Pounds	Value	Pounds	Value
UNMANUFACTURED				
Crude rubber				
From—				
Straits Settlements....	3,457,100	£142,841	3,655,700	£128,765
Federated Malay States	2,618,300	121,228	3,611,400	164,444
British India.....	497,400	21,060	461,600	20,105
Ceylon and Depend- encies	1,524,500	64,817	1,418,200	55,663
Other Dutch Possessions in Indian Seas.....	1,647,300	78,110	423,000	19,445
Dutch East Indies (ex- cept other Dutch Pos- sessions in Indian Seas)	3,005,500	135,433	1,007,000	43,043
Other countries in East Indies and Pacific not elsewhere specified...	184,000	8,948	112,700	4,414
Brazil	232,300	10,550	230,900	7,829
Peru				
South and Central Amer- ica (except Brazil and Peru)	600	18		
West Africa				
French West Africa.	4,400	131	1,800	60
Gold Coast	800	27		
Other parts of West Africa			1,300	33
East Africa (including Madagascar)			6,800	199
Other countries	18,400	846	800	28
Totals	13,190,800	£584,009	10,931,200	£444,028
Waste and reclaimed rub- ber	15,700	£570	27,100	£475
Gutta percha and balata.	268,700	53,912	245,200	26,366
Rubber substitutes			4,000	96
Totals, unmanufactured	13,475,200	£638,491	11,207,500	£470,965
MANUFACTURED				
Boots and shoes, dozen pairs	6,200	£7,572	9,133	£14,847
Tires and tubes, number	94,775	228,801	376,565	429,824
Other rubber manufactures		43,369		85,016
Totals, manufactured.		£279,742		£529,667
Waterproof clothing.				
Insulated wire, number	1,195	£1,431	41	£68
Submarine cables		1,953		6,035

Exports

UNMANUFACTURED				
Waste and reclaimed rub- ber	243,200	£5,524	253,900	£3,795
Rubber substitutes	24,600	545	95,100	2,153
Totals, unmanufactured	267,800	£6,069	349,000	£5,948
MANUFACTURED				
Boots and shoes, dozen pairs	2,826	£6,488	9,772	£16,199
Tire and tubes, number	108,466	111,063	144,411	182,925
Other rubber manufactures		150,471		221,613
Totals, manufactured.		£268,022		£420,737
Waterproof clothing.				
Insulated wire, number	32,897	£60,303	45,317	£55,856
Submarine cables		77,631		48,901
		63,338		44,821

Exports—Colonial and Foreign

UNMANUFACTURED				
Crude rubber				
To Russia	2,200	£93	36,000	£3,063
Sweden, Norway and Denmark	113,900	5,119	193,500	7,253
Germany	1,241,000	36,744	1,440,300	52,221
Belgium	407,100	12,309	243,100	8,293
France	419,200	15,792	1,399,400	51,635
Spain	12,600	567	46,200	1,881
Italy	110,100	3,077	258,900	9,652
Australia	56,500	1,521	67,200	2,400
Other European countries	590,000	18,402	398,100	19,282
United States	1,083,600	40,044	1,655,500	61,201
Canada	38,100	1,645	45,200	1,300
Other countries	13,500	640	171,300	8,132
Totals	4,087,800	£135,953	5,954,700	£226,313
Waste and reclaimed rub- ber			8,100	£295
Gutta percha and balata.	28,600	£3,730	164,600	21,459
Rubber substitutes	2,300	45		
Totals, unmanufactured	4,118,700	£139,728	6,127,400	£248,067
MANUFACTURED				
Boots and shoes, dozen pairs	1	£5	976	£2,547
Tires and tubes, number	12,300	29,951	11,990	28,925
Other rubber manufac- tures		4,028		6,333
Totals, manufactured		£33,984		£37,805
Waterproof clothing.				
Insulated wire, number	70	£227		
Submarine cables				

The Market for Rubber Scrap

New York

Trade in all grades of rubber scrap continues at low ebb. There is very little interest on the part of reclaimers. There is no export trade in inner tubes. In boots and shoes business is limited to small lots, while in mixed tires transactions are at a standstill. All mechanical grades remain without value, as for months past.

A change, effective August 26, has been made in freight classification of rubber scrap in carload lots from fifth to sixth class. The Interstate Commerce Commission has ruled that on shipments of "scrap rubber tires mounted on steel rims" the fifth class rating applies and not the rate for scrap iron.

The Commission held that a rate of 9 cents per 100 pounds on 9 cars of rubber shoddy from Boston to East Cambridge, Massachusetts, used as part of a through rate from Plymouth, Massachusetts, was unreasonable to the extent that it exceeded 2½ cents, which rate was established July 18, 1918.

Quotations for Carload Lots Delivered

August 25, 1922

Prices subject to change without notice

Boots and Shoes

Boots and shoes, black.....	lb.	*\$0.02¼ @ \$0.03
Trimmed arctics	lb.	*.02 @
Untrimmed arctics	lb.	*.01¼ @

Hard Rubber

Battery jars, black compound.....	lb.	*.01 @
glossy	lb.	*.05 @ .06

Inner Tubes

No. 1	lb.	*.03¼ @ .04
Compounded	lb.	*.02¼ @ .03
Red	lb.	*.03 @

Mechanicals

Black scrap, mixed.....	lb.	*.01¼ @
Heels	lb.	*.02¼ @ .03
Horse-shoe pads	lb.	*.02¼ @ .03
Hose, air brake.....	lb.	*.01 @
regular	lb.	*.01 @
Red scrap, mixed.....	lb.	*.07 @ .08
White scrap, mixed.....	lb.	*.07 @ .07½

Tires

PNEUMATIC—

Auto peelings	lb.	*.01¼ @
Bicycle	lb.	*.01 @ .01¼
Standard white auto.....	lb.	*.02¼ @ .02¾
Mixed auto	lb.	*.00¼ @ .01
Stripped, unguaranteed	lb.	*.01 @ .01¼

SOLID—

Carriage	lb.	*.02¼ @ .02¾
Irony	lb.	@
Truck, clean	lb.	*.01¼ @ .02

*Nominal.

Plantation Rubber Exports from Java*

	May		Four Months Ended May 31	
	1921	1922	1921	1922
To Netherlands	516,000	511,000	3,368,000	1,935,000
Great Britain	474,000	345,000	4,326,000	2,386,000
Germany	24,000	144,000	169,000	348,000
France		62,000		83,000
Belgium		11,000		25,000
United States	522,000	1,425,000	2,913,000	5,928,000
Singapore	291,000	363,000	1,338,000	1,354,000
Japan			95,000	70,000
Australia	2,000	11,000	211,000	94,000
Other countries.....			6,000	
Totals	1,829,000	2,872,000	12,426,000	12,234,000
Ports of origin:				
Tandjong Priok.....	647,000	1,168,000	5,492,000	4,880,000
Samarang	81,000	85,000	213,000	214,000
Soerabaya	825,000	1,372,000	5,599,000	5,857,000

*The April figures are verified.

The Market for Cotton and Other Fabrics

New York

A MERICAN COTTON. The strike situation has played an important part in the decline of prices together with the unfavorable reports of the general crop conditions. Unless improved weather conditions prevail vast damage will result from boll weevil ravages. Later in the month, bullish crop figures strengthened the market and spot middlings was quoted 22.25 cents on August 25.

It is generally considered that 12,000,000 bales is the minimum quantity required by export demand for this year. The demand by spinners for spot cotton has been poor owing to their sufficient supply for immediate needs.

Cotton consumption by textile mills in July declined to 458,548 bales, almost 50,000 bales less than in June and the lowest since July, 1921; it was, however, largely a seasonal decline to the end of the crop year. Cotton stocks at mills and warehouses at the end of the crop year totaled 2,703,000 bales, as against 4,834,000 bales a year ago. Imports and exports of raw cotton both declined, largely on account of seasonal conditions. Exports, with one exception, were the lowest since April, 1921.

EGYPTIAN COTTON. Early in the past month long staple cotton prices stiffened on crop condition reports, November-August

shipments of medium Sakellaridis being quoted 34¼ cents, c. i. f. Boston, and medium Uppers 28¼ cents. On August 23 the quotations for prompt shipment were: Medium Sakellaridis, 33½ cents, and medium Uppers, 27½ cents. The market has been irregular during this month but some business has developed on the breaks.

ARIZONA COTTON. The Pima market has continued fairly strong, No. 1 having advanced from 38 cents on August 9 to 39 cents on August 23. The crop is said to be progressing well with a possible yield of 40,000 bales. Present stocks are small.

SEA ISLAND COTTON. This market is quiet and lifeless with no prospect of activity until the new crop is available.

Cotton Fabrics

DUCKS, DRILLS AND OSNABURGS. This market has been strong in keeping with staple cotton advances. Transportation difficulties will undoubtedly compel consumers to stock more goods, thus increasing demand and prices.

RAINCOAT FABRICS. While a slight change for the better in trade demand was noticeable last month, the buying was for immediate needs and quick deliveries.

SHEETINGS. Buying was in a small way. Mills are endeavoring to maintain prices but buyers unwilling to pay top prices.

TIRE FABRICS. This market has been generally quiet and routine in character. Buying was confined to replacement orders for immediate delivery, and centered around the lower-priced American fabrics. Prices have not changed since last month.

New York Quotations

August 25, 1922

Prices subject to change without notice

Burlaps

40—7-ounce	100 yds.	\$5.65	@ \$5.70
40—7½-ounce		5.85	@ 5.90
36—8-ounce		5.90	@ 6.00
40—8-ounce		5.95	@ 6.00
40—10-ounce		8.60	@ 8.70
40—10½-ounce		8.80	@ 8.90

Drills

38-inch 2.00-yard	yard	.20	@
40-inch 3.47-yard .....		.11½	@
52-inch 1.90-yard .....		.21½	@
60-inch 1.52-yard .....		.28	@

Duck

CARRIAGE CLOTH

38-inch 2.00-yard enameling duck	yard	.20½	@
40-inch 1.47-yard .....		.27½	@
72-inch 16.66-ounce .....		.45	●
72-inch 17.21-ounce .....		.46½	@

MECHANICAL

Hose	pound	.39	@
Belting .....		.40	@

Osnaburgs

40-inch 2.35-yard .....		.17¼	@
40-inch 2.48-yard .....		.16½	●
37½-inch 2.42-yard .....		.16½	@

TIRE
FABRICS

JENCKES
SPINNING
COMPANY

PAWTUCKET
RHODE ISLAND

AKRON OFFICE
Second National Building

NEW YORK OFFICE
Fisk Building
Broadway at 57th Street

Fabric Market—Continued

Hollands

DEAD FINISH

Standard, 37-inch, white and colors.....	\$0.18 @
42-inch, white and colors.....	.22 @

FLAT FINISH

Imperial, 36-inch, white and colors.....	.14 @
40-inch, white and colors.....	.17 @

Raincoat Fabrics

COTTON

Bombazine 64 x 60.....yard	.11 1/4 @
60 x 48.....	.10 1/4 @
Cashmeres, cotton and wool, 36-inch, tan.....	.50 @
Plaids 60 x 48.....	.11 1/4 @
56 x 44.....	.11 @
Surface prints 60 x 48.....	.12 1/4 @
64 x 60.....	.13 @

Sheetings, 40-inch

48 x 48, 2.50-yard.....yard	.14 1/4 @
48 x 48, 2.85-yard.....	.12 1/4 @
64 x 68, 3.15-yard.....	.13 1/4 @
56 x 60, 3.60 yard.....	.12 1/4 @
48 x 44, 3.75-yard.....	.10 @

Silks

Canton, 38-inch.....yard	.29 1/2 @
Schappe, 36-inch.....	.43 @

Tire Fabrics

BUILDING

17 1/4-ounce Sakellaridia, combed.....pound	.80 @
17 1/4-ounce Egyptian, combed.....	.70 @
17 1/4-ounce Egyptian, carded.....	.63 @
17 1/4-ounce Preler, combed.....	.70 @
17 1/4-ounce Peeler, carded.....	.54 @

CORD

15-ounce Egyptian, combed.....pound	.73 @
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BICYCLE

8-ounce American.....pound	@
10-ounce American.....	@

CHAFFER

9 1/4-ounce Egyptian, carded.....pound	\$0.71 @
9 1/4-ounce Peeler, carded.....	.62 @

EGYPTIAN COTTON STATISTICS

Consular advices from Alexandria, Egypt, giving the cotton movements of that country during July are as follows:

Exports of cotton from Alexandria, Egypt, during July were 28,000,000 pounds against 39,300,000 pounds for the previous month and 24,821,830 pounds for the corresponding month a year ago. Arrivals of ginned cotton at Alexandria during the month were 12,400,000 pounds compared with 19,800,000 pounds for the previous month and 23,661,000 pounds in July, 1921. Stocks on hand on July 31 amounted to approximately 168,000,000 pounds against 183,000,000 pounds on June 30 and 197,200,000 pounds on July 31 of last year. The condition of the crop is reported satisfactory and the water shortage danger is passed.

COTTON FLOCK

Cotton flock is cut cotton fiber usually made from new cotton rags, and should not be confused with linters which is a product of the cotton gin and lighter than flock. As the same length fiber is not always desired, flock may be ground as fine as flour or cut to a length of 3/16-inch. The raw material must be absolutely clean, free from paper, wood, metal, straw or foreign matter. A most important part in the manufacture of cotton flock is the magnetic separation of the small particles of steel from the cutting knives. Flock should be analyzed for adulterants such as lampblack, clay, asbestos or chalk, when mixed with compounding ingredients for use in soles, insulation and molded shellac products.

The Market for Chemicals and Compounding Ingredients

New York

IN common with all other industries the pigment trade has been affected by the coal and railroad situations, shipments and production both having been interfered with and warehouse stocks reduced. Prices have generally remained unchanged in most lines with consuming demand not very active except in a few lines.

ANILINE. Prices have remained steady and although improved business was noted, trade is light.

ANTIMONY SULPHURET. The market continues nominal with very little interest manifest among consumers.

BARYTES. Trade early in the month was not very active but gained well in volume as the month progressed. Freight movements were notably hard to make.

BENZOL. Output is falling behind, production being reduced to 20 to 25 per cent of normal. At that rate acute shortage cannot be far off with the present heavy demand.

BLANC FIXE. Consumption is reported up to normal with prices steady and unchanged.

CARBON BISULPHIDE. Trade marked by routine seasonal demand only.

CARBON BLACK. This leading black holds a strong position. Both foreign and domestic requirements are large and prices inclined to advance. The rubber industry is the largest consumer and the material is regarded as an essential for tire work. Other grades of black are in good request also for the mechanical rubber lines.

CARBON TETRACHLORIDE. Trade is about as quiescent as in the case of bisulphide. Consumption is routine.

CHINA CLAY. The demand is seasonal and chiefly for imported grades, which are reported in low stock. The railroad situation is bad for the business of domestic producers.

DRY COLORS. These have not been especially active although there is a steady trade in most lines.

LITHARGE. The market has ruled quiet and steady with improvement expected.

LITHOPONE. Although production costs are said to have increased there has been no advances in price. Good business is likely to continue the remainder of the year. The consuming demand continues heavy for both rubber and paint purposes.

SOLVENT NAPHTHA. Supplies are reported short and trade good.

SUBLIMED LEAD. Quiet and steady conditions as in the case of litharge. Both materials are standard for rubber makers' use, which accounts for a considerable routine demand.

SULPHUR. Trade is marked by the usual steady call from the manufacturing industries, including rubber.

SULPHUR CHLORIDE. Prices are very weak and trade dull.

TALC. Foreign and domestic grades are active, as usual.

WHITING. Business is of steady routine nature with the outlook good.

ZINC OXIDE. There has been no advance in price for a year, although spelter has gone up. Early in the month a reduction of 1/2 cent a pound was announced. Leading grades of oxides are in good request by the tire industry at the present time.

Accelerators, Organic

Accelerene (f. o. b. English port).....lb.	13s. @	
Adco.....lb.	\$0.54 @	
Aldehyde ammonia crystals.....lb.	.90 @	.95
Aniline (f. o. b.) factory.....lb.	.14 @	.16
Diphenyl guanidine.....lb.	1.20 @	1.50
Ethylidene aniline.....lb.	.80 @	.90
Excellerex.....lb.	.35 @	.40
Formaldehyde aniline.....lb.	.45 @	.50
Hexamethylene tetramine.....lb.	.70 @	.72
Lead oleate (bbils.).....lb.	.14 @	
Methylene aniline.....lb.	.34 @	.40
N. C. C.....lb.		
No. 999.....lb.	.13 3/4 @	
Paradin.....lb.	.38 @	
Paraphenylene diamine.....lb.	1.55 @	1.57
Super-sulphur, No. 1.....lb.	.50 @	.60
Super-sulphur, No. 2.....lb.	.25 @	.30
Super-X.....lb.	.50 @	
Super-XX.....lb.	.80 @	
Thiocarbamide.....lb.	.26 @	.35
Vul-Ko-Cene.....lb.	.35 @	
XLO.....lb.	1.20 @	

Accelerators, Inorganic

Lead, dry red.....lb.	.09 @	.10
white, basic carbonate.....lb.	.07 3/4 @	.08
Lime, flour, superfine.....lb.	.02 @	.02 3/4
Litharge, domestic.....lb.	.08 1/2 @	.08 3/4
imported.....lb.	*.17 @	
Orange, mineral.....lb.	.12 @	.14
Magnesia, carbonate, light (bags).....lb.	.06 @	.07
calcined, light (bbils.).....lb.	.23 @	.24
calcined, ex. light (bbils.).....lb.	.45 @	
calcined, md. light (bbils.).....lb.	.15 @	
calcined, heavy (bbils.).....lb.	.05 @	.05 1/4
oxide, heavy.....lb.	.06 @	

Acids

Acetic 28% (bbils.).....cwt.	2.67 1/2 @	2.92 1/2
glacial, 99%.....lb.	10.07 @	10.32
Cresylic (97% straw color) gal.	.56 @	.58
(95 dark).....gal.	.51 @	.53
Muriatic, 20 degrees.....cwt.	1.10 @	1.25
Nitric, 36 degrees.....cwt.	4.75 @	5.25
Sulphuric, 66 degrees.....ton	14.00 @	16.00

Alkalies

Caustic soda.....cwt.	3.50 @	3.75
Soda ash, 58% (bbils.).....cwt.	1.95 @	2.30

Colors

BLACK		
Bone, powdered.....lb.	.05 1/4 @	.07 1/4
Carbon black.....lb.	.16 @	.22
pressed.....lb.	.17 @	
Dipped goods.....lb.	1.00 @	
Drop.....lb.	.07 1/2 @	.16
Hypsulphite of lead.....lb.	.20 @	.25
Iron oxide.....lb.	.04 1/4 @	.16
Ivory black.....lb.	.15 @	.45
Lampblack.....lb.	.12 @	.40
Micronex.....lb.	.17 @	.24
Rubber maker's black.....lb.	.40 @	
BLUE		
Cobalt.....lb.	.21 @	.26
Dipped goods.....lb.	1.00 @	
Prussian.....lb.	.60 @	
Rubber maker's blue.....lb.	3.50 @	
Ultramarine.....lb.	.10 @	.35
BROWN		
Iron oxide.....lb.	.04 @	.05
Sienna, Italian.....lb.	.05 @	.06 1/2
Umber, Turkey.....lb.	.04 1/4 @	.06
Vandyke.....lb.	.06 @	.07
GREEN		
Chrome, light.....lb.	.30 @	.32
medium.....lb.	.35 @	.36
dark.....lb.	.36 @	.45
commercial.....lb.	.12 @	
tile.....lb.	.11 @	.13
Guignet.....lb.	1.50 @	
Dipped goods.....lb.	1.00 @	
Oxide of chromium.....lb.	.45 @	.57
Rubber maker's green.....lb.	3.50 @	
RED		
Antimony, crimson.....lb.	.40 @	
crimson, 15/17 free.....lb.	.36 @	.44
crimson, R.M.P. No. 3.....lb.	.35 @	
crimson F.....lb.	.35 @	
Antimony, golden.....lb.	.27 @	
golden R.M.P. No. 7.....lb.	.17 @	.22
golden, 15/17 free.....lb.	.17 @	
golden 1.....lb.	.30 @	
golden 2.....lb.	.25 @	
7-A.....lb.	.25 @	
vermillion.....lb.	.55 @	
red sulphuret.....lb.	.20 @	
Arsenic sulphide, red.....lb.	11 1/4 @	.13
lemon.....lb.	.75 @	1.00
orange.....lb.	.75 @	1.00
Cadmium sulphide.....lb.	1.85 @	
cold cure.....lb.	1.70 @	1.85
hot cure.....lb.	1.40 @	1.55
Dipped goods red.....lb.	1.00 @	
purple.....lb.	1.00 @	

Chemical Market—Continued

New York Quotations

August 25, 1922

Prices subject to change without notice

orange.....lb.	\$1.00 @	
Indian.....lb.	.08 @	\$0.12
Indian maroon, English.....lb.	.12 1/2 @	
Iron oxide, reduced grades.....lb.	.10 @	.12
pure bright.....lb.	.12 @	.14
Maroon oxide.....lb.	.08 @	.12
Red oxide, crimson.....lb.	.05 1/2 @	
English.....lb.	.12 @	
Spanish.....lb.	.04 @	
Oximony.....lb.	.16 @	
Para toner.....lb.	1.10 @	1.20
Rubber maker's red.....lb.	3.50 @	
purple.....lb.	2.50 @	
Spanish natural.....lb.	.03 1/2 @	.04 1/2
Toluidine toner.....lb.	2.25 @	2.50
Venetian.....lb.	.02 1/2 @	.05 1/2
Vermilion, American.....lb.	.25 @	.30
English quicksilver.....lb.	1.05 @	1.10

WHITE

Albalith.....lb.	.06 @	.06 1/2
Aluminum bronze.....lb.	.55 @	.60
Lithopone, domestic.....lb.	.06 @	.06 1/2
Zinc oxide:		
American Horse Head.....lb.	.07 1/2 @	.08
Special.....lb.	.07 @	.07 1/2
XX red.....lb.	.07 @	.07 1/2
French process, Florence.....lb.		
White seal.....lb.	.11 @	.11 1/4
Green seal.....lb.	.09 3/4 @	.10 1/4
Red Seal.....lb.	.08 3/4 @	.09 1/4
Zinc sulphide.....lb.	.45 @	
Azo (factory):		
ZZZ (lead free).....lb.	.07 @	.07 1/2
ZZ (—5%) leaded.....lb.	.06 1/4 @	.06 3/4
(8/10% leaded).....lb.	.06 @	.06 1/2

YELLOW

Arsenic, yellow.....lb.	1.00 @	
Cadmium, sulphide, light.....lb.	1.85 @	
Chrome, light and med.....lb.	.10 @	
Dipped goods.....lb.	1.00 @	
India rubber.....lb.	1.00 @	
Ochre, domestic.....lb.	.02 1/2 @	.02 3/4
imported.....lb.	.03 1/4 @	.03 1/2
Rubber maker's yellow.....lb.	3.50 @	

Compounding Ingredients

Aluminum flake (carloads) ton	25.00 @	30.00
hydrate, light.....lb.	.17 @	.18
Ammonia carbonate.....lb.	.06 3/4 @	.08 3/4
Asbestine.....ton	20.00 @	25.00
Aluminum silicate, C. L.....ton	22.00 @	25.00
Barium, carbonate, precip.....ton	85.00 @	90.00
dust.....ton	23.50 @	
Barytes, pure white C. L.....ton	20.00 @	
off color (carloads).....ton	23.50 @	
uniform floated (carloads) ton	23.50 @	
Basofor.....lb.	.04 3/4 @	
Beta-naphthol.....lb.	.25 @	
Blanc fixe.....lb.	.04 @	.04 1/4
Carrara filler (factory).....ton	18.00 @	
Chalk, precip, extra light.....lb.	.03 1/2 @	.04 1/4
heavy (f.o.b. factory).....lb.	.02 1/2 @	.03 1/4
China, clay, Dixie.....ton	22.00 @	32.00
Blue Ribbon.....ton	14.00 @	
Blue Ridge.....ton	22.00 @	32.00
Cotton linters clean mill-run.....lb.	.05 @	
Fossil flour (powdered).....ton	60.00 @	
(bolted).....ton	60.00 @	
Glue, high grade.....lb.	.30 @	.40
medium.....lb.	.20 @	.26
low grade.....lb.	.15 @	.18
Graphite, flake.....lb.	.05 @	.12
amorphous.....lb.	.05 @	
Infusorial earth (powd.).....ton	60.00 @	
(bolted).....ton	65.00 @	
Liquid rubber.....lb.	.15 @	
Mica, powdered.....lb.	*.15 @	
Pumice stone, powdered.....lb.	.03 @	.05
Rotten st., powd. (bbils.).....lb.	.02 1/2 @	.04 1/2
Silica, gold bond.....ton	35.00 @	
silver bond.....ton	35.00 @	
Soap bark, cut.....lb.	.08 1/2 @	.10
Soapstone, powdered, gray.....ton	12.00 @	
Starch, powd. corn (bags).....cwt.	2.57 @	2.77
(bbils.).....cwt.	2.85 @	3.05
Talc, soapstone.....ton	22.50 @	
Terra blanche.....ton	23.00 @	25.00
Tripoli flour, cream or rose ton	25.00 @	27.50
white (factory).....ton	27.50 @	30.00
Tyre-lith.....ton	90.00 @	95.00
Whiting, Alba.....cwt.	25.00 @	30.00
chalk.....cwt.	1.00 @	1.10
commercial.....cwt.	20.00 @	
Danish.....cwt.	1.60 @	1.75
English cliffstone.....cwt.	1.15 @	1.25
gilders (bolted).....cwt.	1.15 @	
K. T.....ton	14.00 @	
Paris, white, American.....cwt.	1.25 @	1.35

Perfection.....ton	\$22.00 @	\$25.00
Plymouth.....ton	16.00 @	18.00
Hard hydrocarbon.....ton	30.00 @	32.00
Quaker.....ton	13.00 @	15.00
Superfine.....ton	30.00 @	
Wood pulp, XXX.....ton	25.00 @	
X (f.o.b. factory).....ton		

Mineral Rubber

Gilsonite.....ton	70.00 @	
Genasac (factory).....ton	30.00 @	32.00
Hard hydrocarbon.....ton	32.00 @	35.00
Soft hydrocarbon.....ton	30.00 @	
320/340 M. P. hydrocarbon.....ton		
300/310 M. P. hydrocarbon.....ton		
Pioneer, M. R., solid (fac.).....ton	42.00 @	44.00
M. R. granular.....ton	52.00 @	54.00
Robertson, M. R., solid.....ton	35.00 @	75.00
M. R. granular (factory).....ton	54.50 @	72.50
Rubrax (factory).....ton	50.00 @	
States "A".....ton	45.00 @	
No. 1.....ton	40.00 @	
Synpro, gran. M. R. (fac.) ton	65.00 @	75.00

Oils

Avioils compound.....lb.	.15 @	
Castor, No. 1, U. S. F.....lb.	.13 @	
No. 3, U. S. F.....lb.	.12 @	
Corn.....lb.	.09 1/4 @	
Cotton.....lb.	.10 1/2 @	
Glycerine.....lb.	.17 @	.17 1/2
Halowax (500-lb. drums).....lb.	.25 @	.27
Linseed, raw.....gal.	.78 @	
Palm lagos.....lb.	.07 @	.07 1/2
Palm, niger.....lb.	.07 3/4 @	
Peanut.....lb.	.08 1/2 @	
Petrolatum, standard.....lb.	.05 @	.08
Petrolatum, sticky.....lb.	.08 @	.10
Pine, steam distilled.....gal.	.85 @	.90
Rapeseed, refined.....gal.	.92 @	
blown.....gal.	.95 @	1.00
Rosin.....gal.	.40 @	.55
Synpro.....gal.	.40 @	.70
Soya bean.....lb.	.10 @	
Tar.....gal.	.27 @	

Resins and Pitches

Cumar resin hard.....lb.	.09 @	.15
soft.....lb.	.09 @	.15
Tar, retort.....bbl.	10.00 @	11.50
kin.....bbl.	9.50 @	12.00
Pitch, Burgundy.....lb.	.05 @	
coal tar.....lb.	.01 1/4 @	
hardwood.....ton	40.00 @	60.00
pine tar.....lb.	.03 @	
ponto.....lb.	.08 @	
Rosin, K (bbl.).....280 lbs.	6.75 @	
strained (bbls.).....280 lbs.	6.40 @	
Shellac, fine orange.....lb.	*.90 @	

Solvents

Acetone (98.99% drums [6.62 lbs. per gal.].....lb.	.10 1/2 @	.12
Benzol (90% drums [7.21 lbs. per gal.].....gal.	.27 @	.32
pure (drums).....gal.	.30 @	.35
Carbon bisulphide (dms. [10.81 lbs. per gal.].....lb.	.05 3/4 @	.06
tetrachloride (drums. [13.28 lbs. per gal.].....lb.	.09 @	.11
Motor gasoline (steel bbls.).....gal.	.25 @	
Naphtha, V. M. & P.....gal.	.24 @	
solvent (drums extra).....gal.	.23 @	
Paracymene (factory).....lb.	.15 @	
Toluol, pure (7.21 lbs. per gal.).....gal.	.30 @	.35
Turpentine, spirits.....gal.	1.32 @	
wood, steam distilled.....gal.	1.22 @	

Substitutes

Black.....lb.	.08 @	.14
Brown.....lb.	.10 @	.15
White.....lb.	.09 @	.16
Brown factice.....lb.	.08 @	.14 1/2
White factice.....lb.	.09 @	.15

Vulcanizing Ingredients

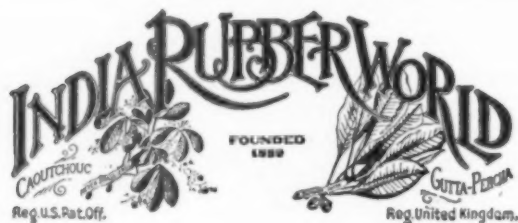
Black hypo.....lb.	.25 @	.35
Sulphur chloride (drums).....lb.	.08 @	
(jugs).....lb.	.13 1/2 @	
Sulphur, Bergenport brand, 100% pure (bbils.).....cwt.	2.55 @	2.90
(bags).....cwt.	2.30 @	2.65
Sulphur flour (bbils.).....cwt.	2.60 @	3.15
(bags).....cwt.	2.35 @	2.90
Superfine 100% pure.....cwt.	2.60 @	3.15

(See also Colors—Antimony)

Waxes

Wax, beeswax, white, com.....lb.	.45 @	
ceresine, white.....lb.	.12 @	
carnauba.....lb.	.20 @	
montan.....lb.	.03 1/4 @	.04
ozokerite, black.....lb.	.18 @	
green.....lb.	.26 @	.27
paraffine.....lb.	.02 3/4 @	.06 1/4
sweet wax.....lb.	.12 @	

*Nominal.



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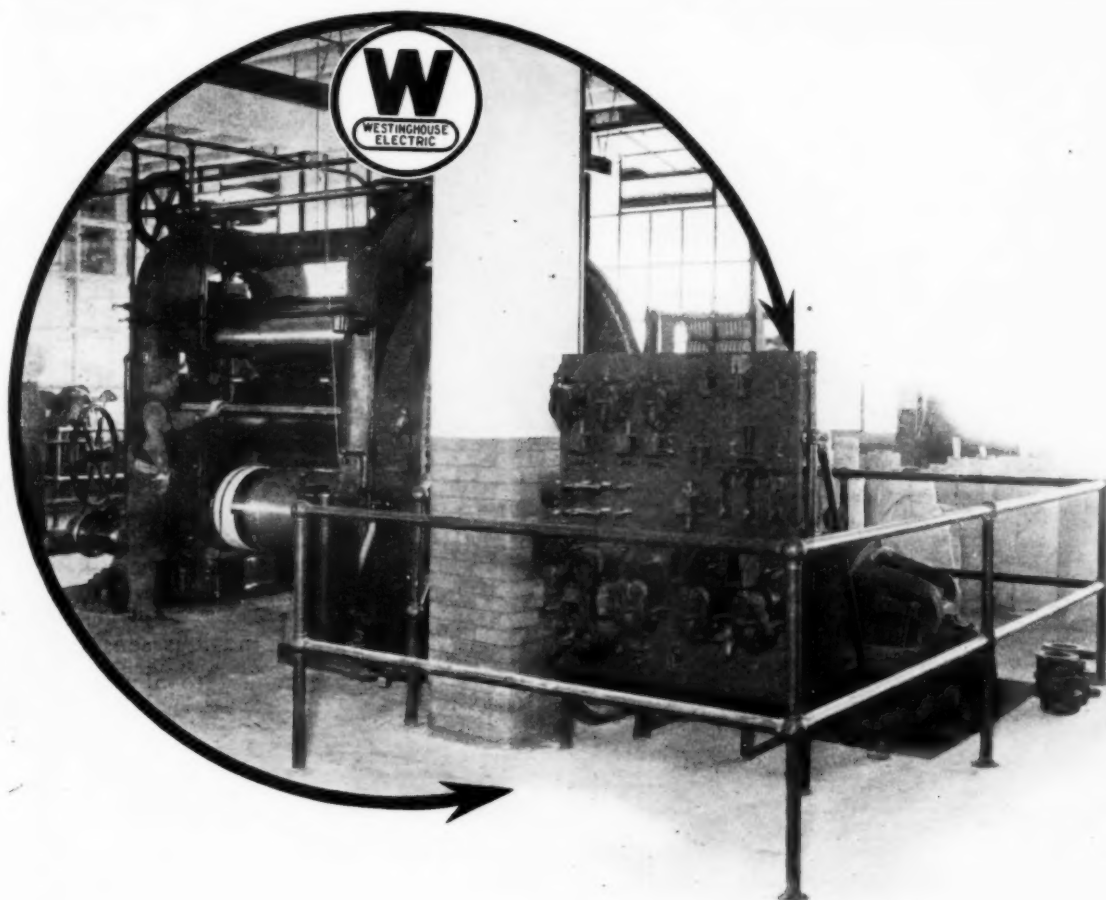
"OUR GOODS WILL WEAR OUT—BUT THEY TAKE THEIR TIME ABOUT IT"

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Cincinnati, New York, Chicago



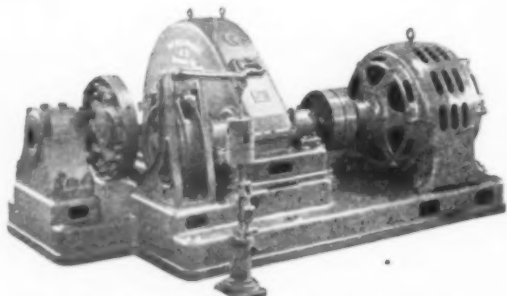
EXACT CONTROL

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A recent report from an installation of four large automatic calender controllers showed perfect operation at all times with a maintenance cost of practically nothing in five years.

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Rubber Mill Bulletin No. 2

Farrel Rubber Mill Machinery includes

Calenders, Mills, Masticators, cooling Drums, Improved Calender Guides, Chilled Rolls, Improved Mill Aprons, Reduction Gears, Friction Coil Clutches, Presses, Hose Machines, Asbestos Sheeters, etc., etc.

IF you are contemplating renewals or additions to equipment in your plant, either now or in the future, you will be interested in the large folder which we have just issued and which deals with the latest developments in Rubber Mill machinery.

May we send you a copy of this folder to retain on file for future reference?

It contains a slip upon which your present or contemplated needs can be conveniently checked and which, when returned to us, will bring you full information at the time desired.

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Circular Tube Curing Mandrels

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You can reduce your production costs by having straight Mandrels rebuilt.

Worn out Mandrels can be rebuilt for about one half the cost of a new Mandrel.

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The modern method of drying Sheet Rubber thoroughly and uniformly at low temperatures, eliminating the danger of overheating, and away from contact with the air — preventing oxidation, is in a DEVINE VACUUM CHAMBER DRYER.

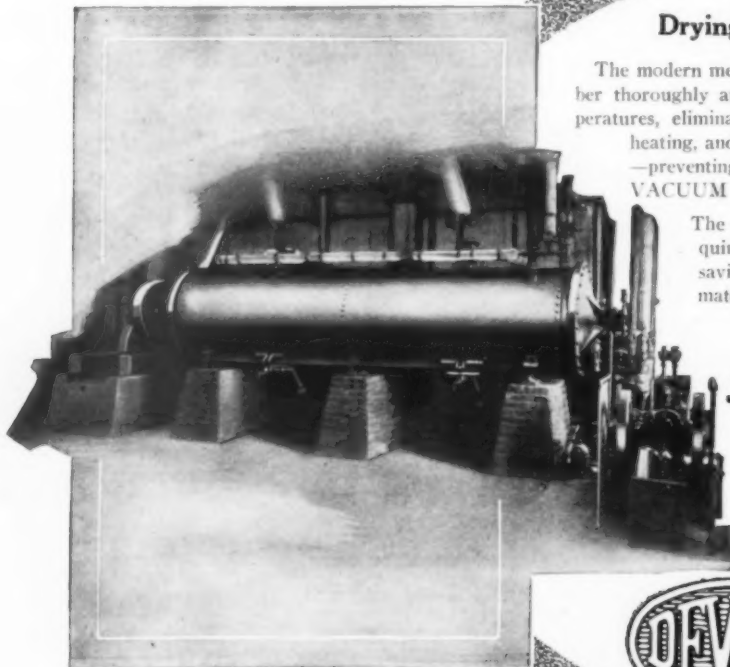
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See our exhibit at the Eighth National Exposition Chemical Industries, Grand Central Palace, New York City, Sept. 11-16, 1922.

The New Thropp Quick Acting Collapsible Cord Tire Forming Core and Chuck



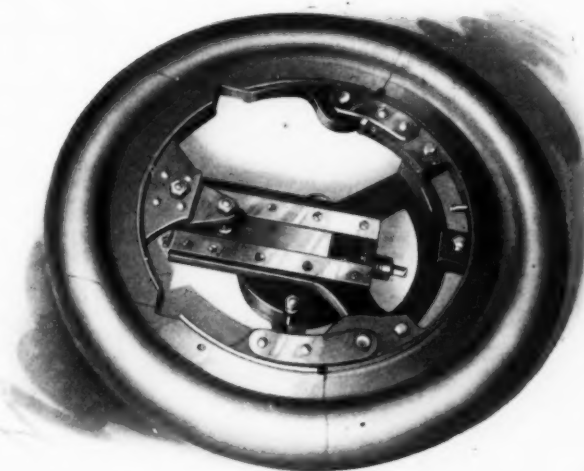
Interchangeable on Tire
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The fastest and best constructed chuck and core now on the market.

This core can be collapsed, tire removed and the core re-assembled in thirty (30) seconds. The pictures tell the story.

Let us tell you how to produce eight (8) finished cord tires per hour with two operators, by using our tire making machine, and one of these cores and chucks.

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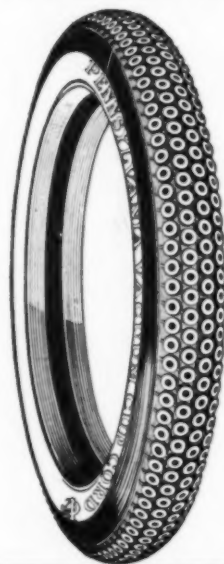
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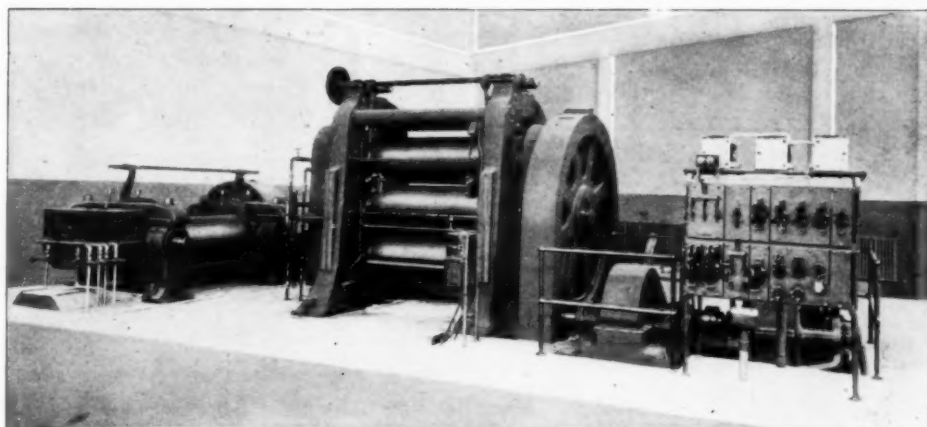
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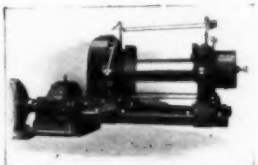
11 Mercer Street, New York, N.Y.



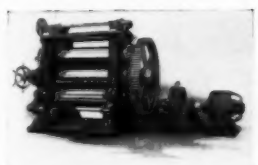
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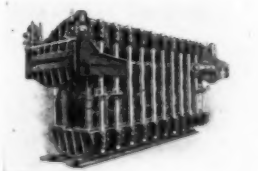
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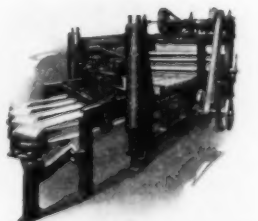
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INCORPORATED 1850

Established 1874

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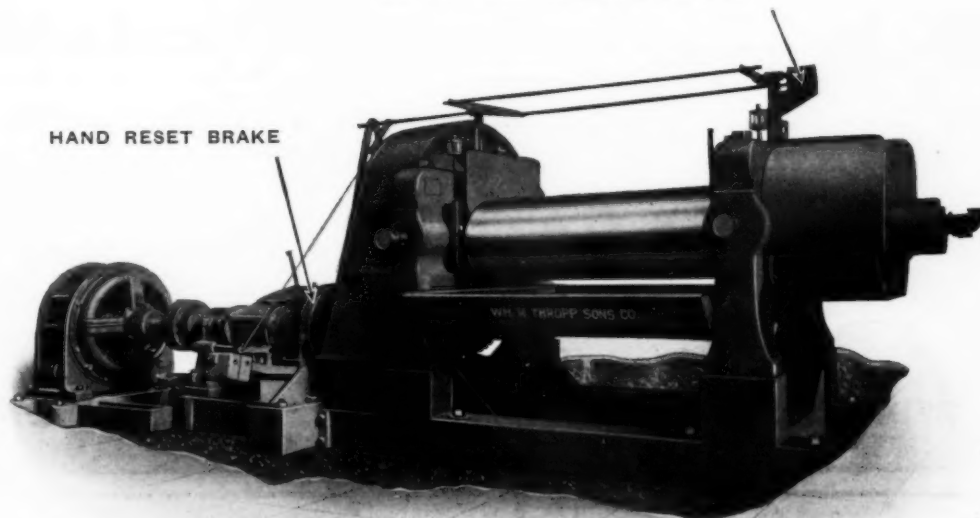
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Driven by a 100 horse-power Motor, 720 r. p. m., with a flexible coupling between the motor and drive. Gear drive is the herringbone type; pinion is forged steel and cut on shaft, reduction gear is of open hearth steel, cut. Top cap frames with steel gibs. All iron automatic adjustable guides; oil cups at the top of frames with pipes passing through same to lubricate the bearings. Equipped with all our "Safety First" equipment. Pan under the small connecting gears, and steel guard over same, with end shield and thimbles over stuffing boxes to contain oil and for protecting gears for safety. Master Gear enclosed in wire mesh guard.

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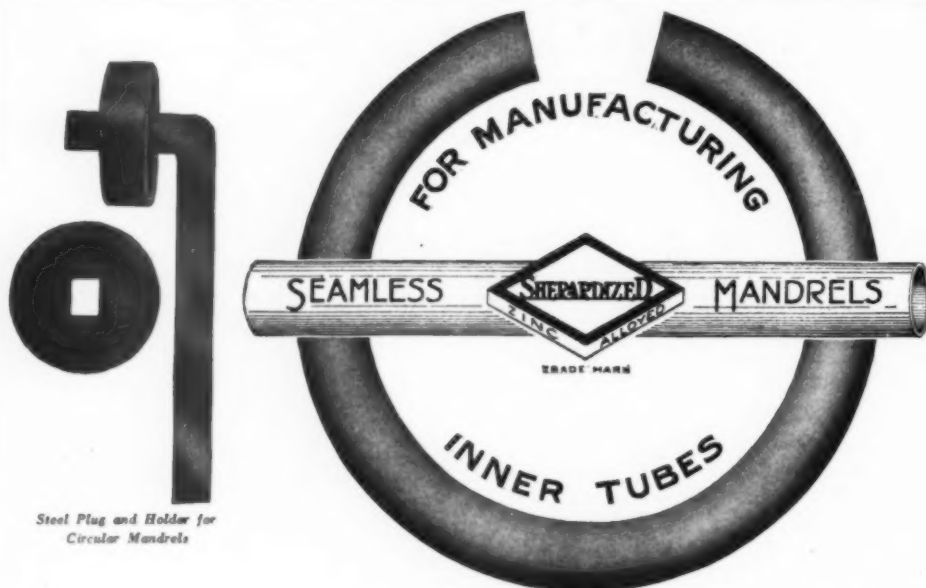
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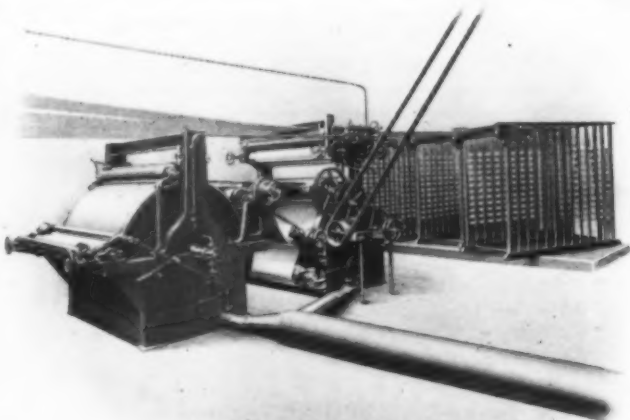
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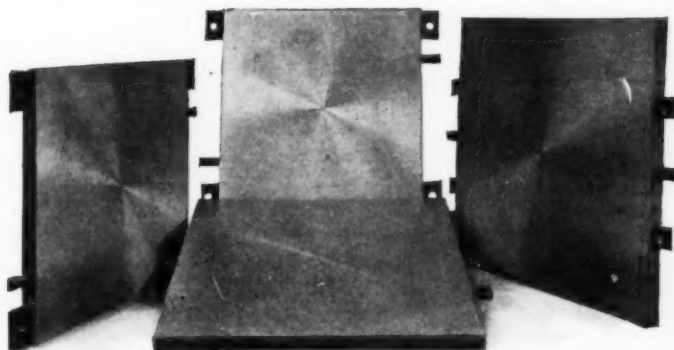
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Steel castings throughout with special mixture cast iron ram and copper-lined cylinder. Top packing arranged with separate gland for quick replacement. Independent steel ram head. The compactness of our all steel press decreases weight and bulk with an increased amount of strength and durability. Standard sizes, 20" x 20" up to 42" x 42".

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PATENTED

Tire is stripped and core re-assembled in less than one minute.

Core can be transferred to or from Machine or Tire Stand quicker than Core requiring Self-Centering Chuck.

OPERATED BY HAND,
AIR OR POWER

THE "AUTOMATIC"

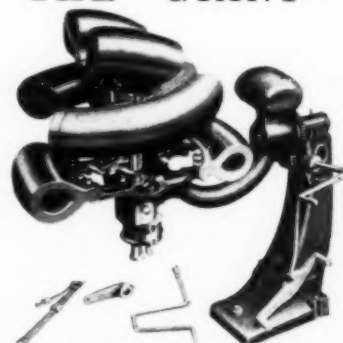
LESS THAN 10 SECONDS
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PATENT APPLIED FOR

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The difficulty of removing Giant Tires from Core is reduced to a minimum, requiring but few minutes by single operator.

MAY BE FITTED TO ANY
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One chuck mounted in fixed relation to machine will accommodate any size core for standard automobile tire sizes.

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Everybody likes a “good mixer”. Other things being equal, you like to give your business to salesmen who are “good mixers”—men who combine good salesmanship with good fellowship. And you want your own salesmen to be “good mixers” because you know that such salesmen bring home more orders.

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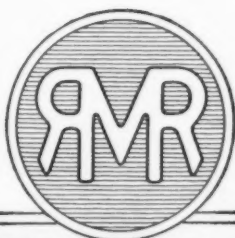
Robertson Mineral Rubber (RMR) is such a material. It combines readily with crude rubber and with all other rubber-compounding elements. It softens a stock and makes the rubber mix easier to work. It is quickly and homogeneously distributed throughout the mass.

And being a “good mixer”, RMR makes such a close union with the other compounding ingredients that it fills the spaces otherwise occupied by air and excludes much of the air which is always included to a considerable extent in every rubber mix. Thus it lessens internal oxidation and in consequence, the durability of the finished product is increased.

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Superior Quality Tire Fabrics

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the
Original Black Sheet

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We have long since earned the reputation as being EXPERTS in the mechanical line.

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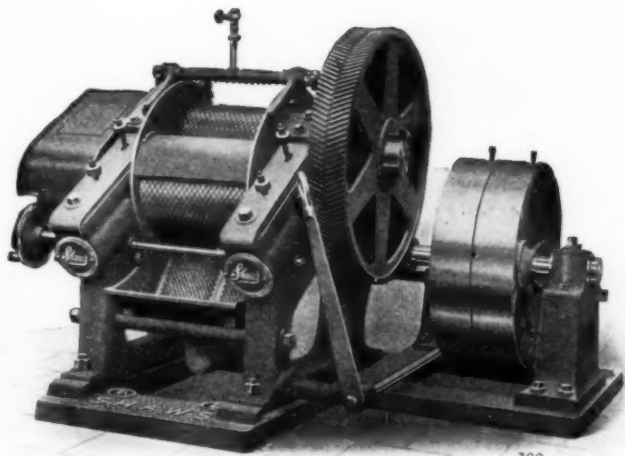
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**ANGULAR
WASHING MACHINE
18" x 12"
PULLEY DRIVEN**

This is the most popular Washing Machine used in Estate Factories and represents the type of which we have supplied thousands to all rubber growing countries. It is the last word in the refinement of design of Washing Machinery. It is fitted with all the latest improvements, including Double Helical Machine cut Driving Gears, Aluminum Guide and Rest Plates, Totally Enclosed Roller Adjusting Gear, Safety Bushes in each Frame, Ring Oiling Bearing Blocks and Pedestals.

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The machine is also supplied with horizontal rollers.

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equipped with three-eighth
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It is of the same high quality as our

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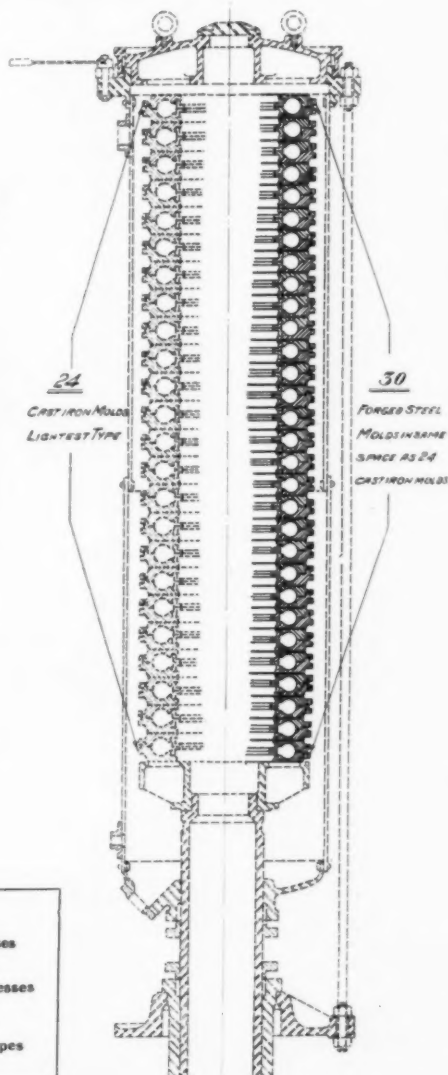
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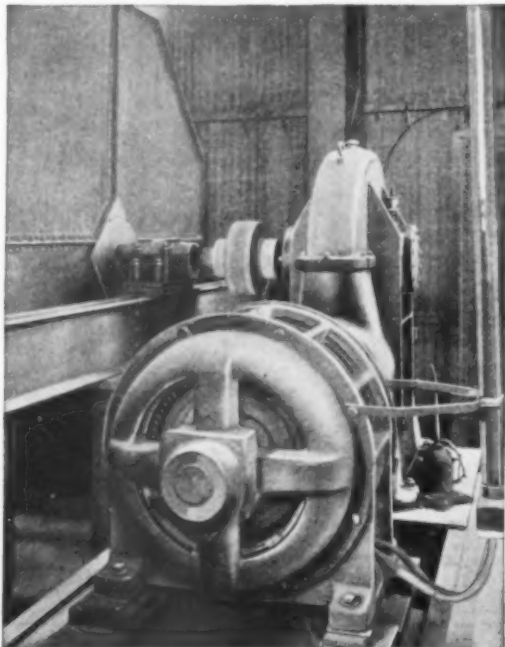
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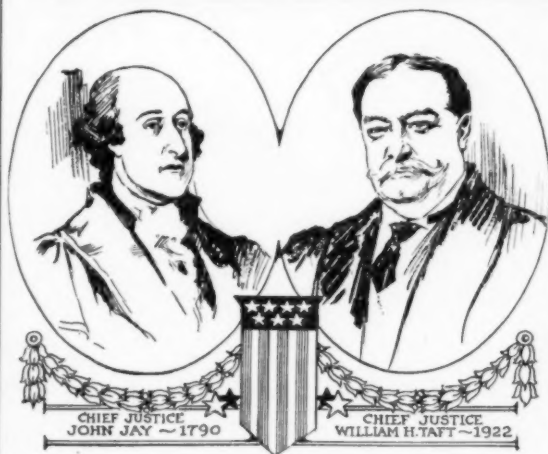
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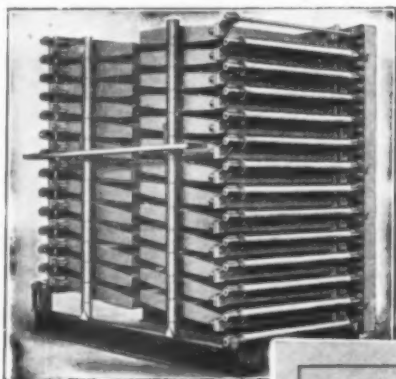
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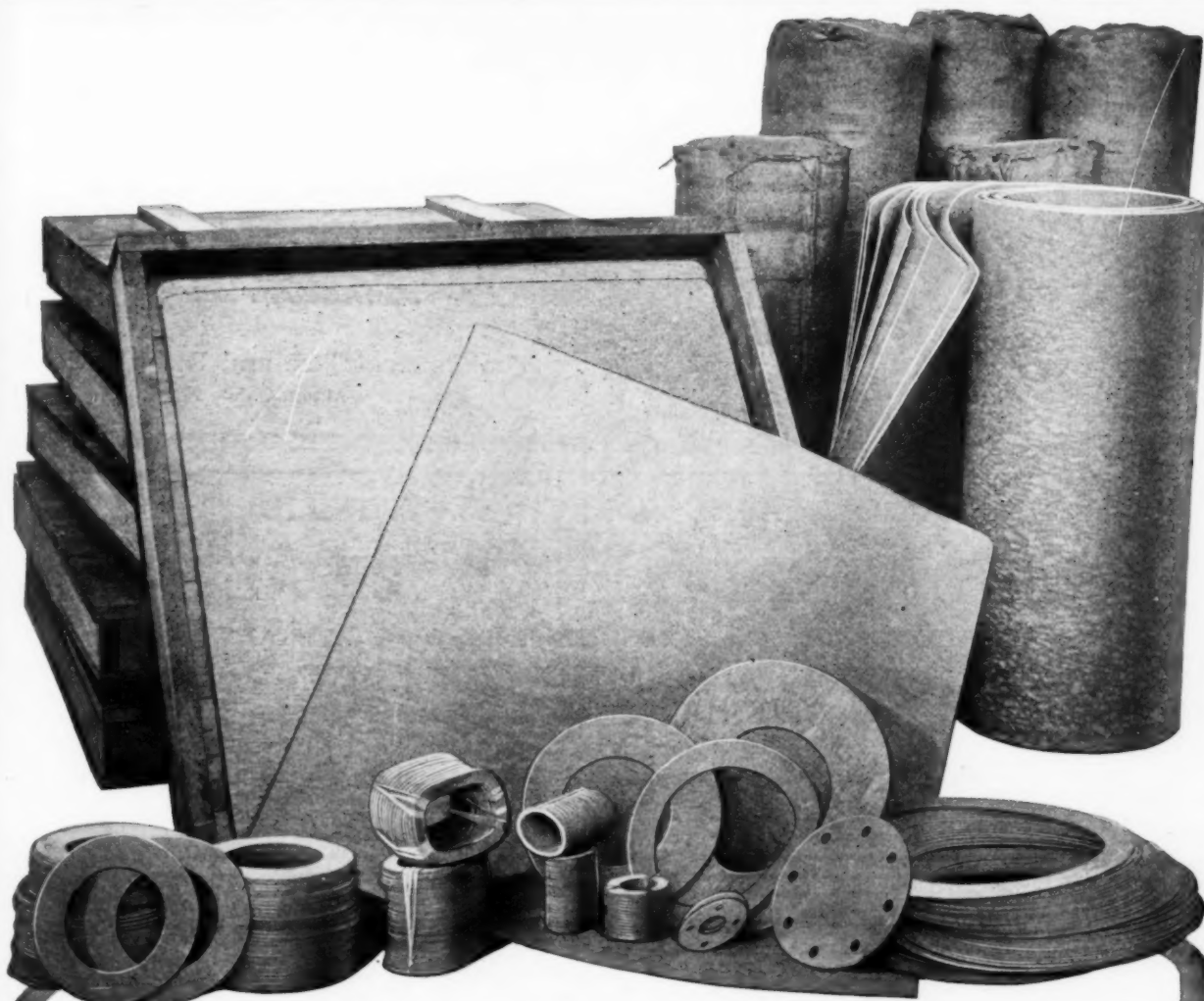
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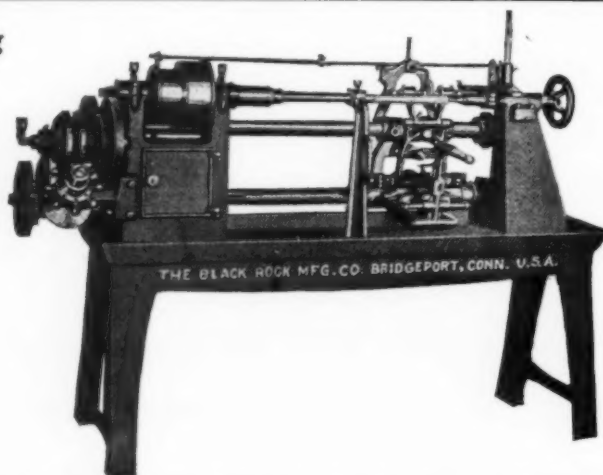
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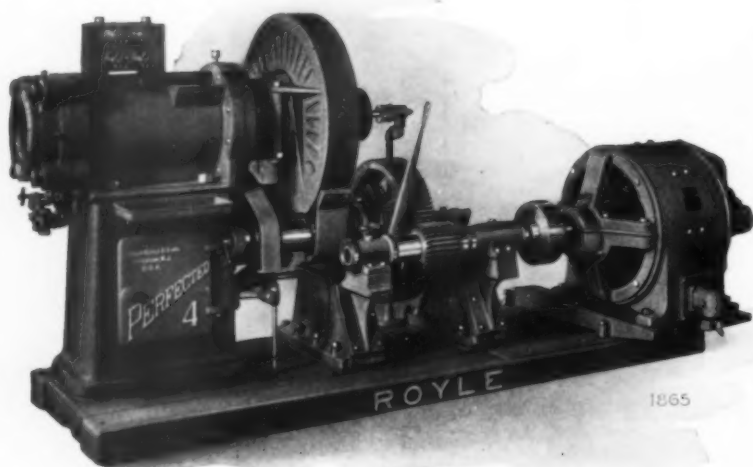
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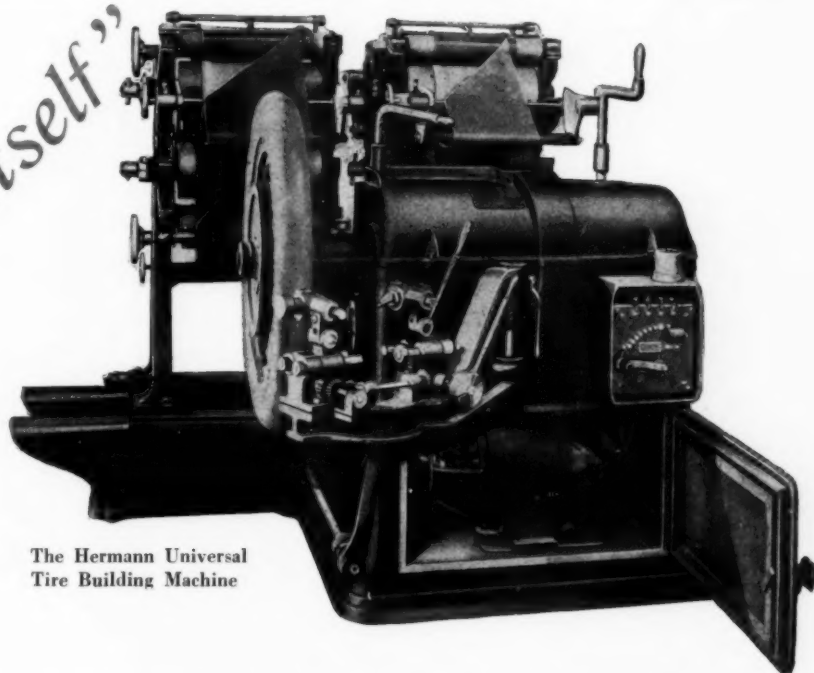
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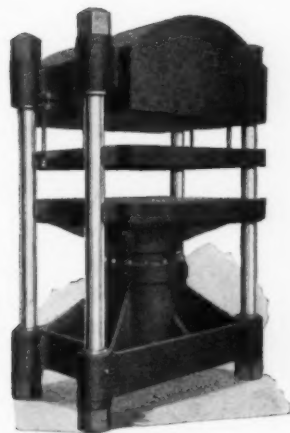
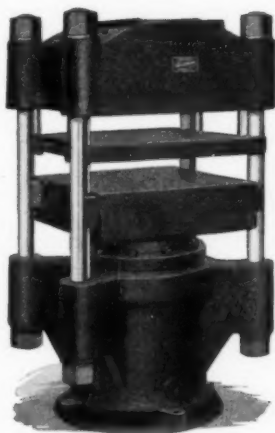
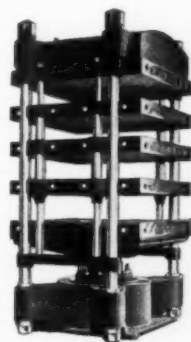
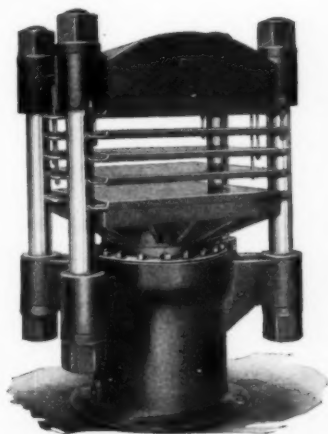
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III	History of the Pneumatic Tire, Continued.	XVIII	Tire Molds.	XXXIV	Tire Rims and Fastenings.
IV	India Rubber, Wild and Cultivated.	XIX	Tire Building.	XXXV	The Tire Pump.
V	Preliminaries in Rubber Manufacture.	XX	Tire Building, Continued.	XXXVI	Valves for Pneumatic Tires.
VI	Calenders and Calendering.	XXI	Cloth Wrapping Machines.	XXXVII	Tire Tools and Accessories.
VII	Rubber and Gutta Percha Cements.	XXII	Cord Tire Manufacturing Machinery.	XXXVIII	Treads and Anti-Skidding Devices.
VIII	Spreaders and Impregnators.	XXIII	Vulcanizers and Presses.	XXXIX	The Care of Tires.
IX	Pneumatic Tire Fabrics.	XXIV	Tire Finishing Machinery.	XL	Inner Tube Repair.
X	Pneumatic Tire Fabrics, Continued.	XXV	Tire Fillers.	XLI	Fabric Tire Repair.
XI	Cord Tire Fabrics and Cord Tires.	XXVI	Flaps, Reliners and Blow-Out Patches.	XLII	Retreading Tires.
XII	Cord Tire Fabrics and Cord Tires, Continued.	XXVII	Tire Tests and Testing Machines.	XLIII	Cord Tire Repair.
XIII	Bias Fabrics.	XXVIII	Tire Sizes and Inflation.	XLIV	Tire Rebuilding.
XIV	Tread Making and Applying Machinery.	XXIX	Bicycle Tires in General.	XLV	Bicycle Tire Repair.
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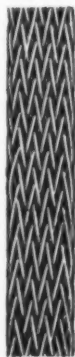


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Give full shades with 1% to 2%.

SEND for colored vulcanized rubber samples, and the GRITLESS COLORS themselves.

OUR Rubber Laboratory is at your disposal.

LET us help you solve your COLOR PROBLEM.

GRITLESS RUBBER COLORS

ONLY MADE BY

THE AULT & WIBORG CO.

CINCINNATI, OHIO, U. S. A.

STERLING

(TIRE)

Reclaimed Rubber

A washed casing stock made especially for the Insulated Wire trade. Absolutely clean, uniform, good tensile strength and elongation and with excellent aging qualities.

In fact

It's all its name implies!

PEQUANOC RUBBER CO.

OFFICE AND WORKS

BUTLER

NEW JERSEY

CALL on us
when you
must have rush
delivery of any
grade of crude
or scrap. Our
nearest branch
can take care of
your needs in
the shortest
time possible.

H. MUEHLSTEIN & CO., Inc.

CRUDE RUBBER SCRAP

NEW YORK
Liggett Bldg., 42d St. and
Madison Ave.

CHICAGO
114 W. Van Buren Street

AKRON
416 Metropolitan Bldg.

BOSTON
176 Federal Street

WAREHOUSES: HOBOKEN, N. J.

BRIDGE'S

For Plantation and Factory

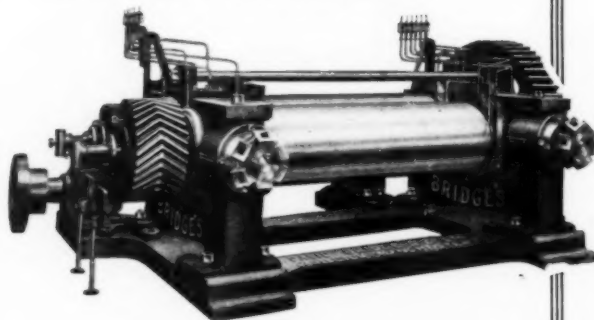
In almost every place where rubber is grown Bridge's Machinery may be found working with unvarying success. In the manufacture of rubber it has proved itself to be the most efficient and reliable machinery it is possible to install.

Whether a single machine or a complete installation is required, every detail of construction and workmanship may be thoroughly depended upon. The latest improvements, the most modern ideas, and the successful experience of half-a-century are at your service.

Representative for U. S. A.
W. D. CRUMPTON & CO., 8-10 Bridge St., New York City

Representative for Canada
BAWDEN MACHINE CO., LTD., Toronto

MODERN RUBBER MACHINERY



"Goliath" Single-Geared Mixing Mill

Rollers 22 ins. (front) and 26 ins. (back) by 84 ins. wide, arranged with driving shaft at back, above floor level. One attendant can handle a large batch easily and efficiently, effecting considerable saving in labor costs.

DAVID BRIDGE & Co. Ltd.
ENGINEERS, IRON AND BRASS FOUNDERS
Castleton, Manchester Eng.
London Office — — 35 Queen Victoria St. E.C.

Are You Open to Suggestion?

In these days of keener competition, when you must meet your competitor's price as well as his quality, resourcefulness is your chief asset. You must utilize every means of reducing manufacturing costs while still maintaining quality.

Using the proper proportion of U. S. Reclaimed Rubber in your compounds will save time, reduce labor, increase production, lower costs, improve your product and insure definite results. We can demonstrate to your satisfaction that it is the ideal Plasticator.

Our chemists have been advising leading rubber goods manufacturers in the latest and most efficient compounding practice with reclaimed. This long experience and the services of a fully equipped laboratory are at your command to help work out your specialized problems in strict confidence.

United States Rubber Reclaiming Co., Inc.

20 West 60th St., New York, N. Y.

Factories, Buffalo, N. Y.

Advantages of U. S. R. rubber as a PLASTICATOR: Quick moving compound. Definite filler ingredients. Known tensile and elongation rubber. Live rubber after vulcanization—not a dead filler. Better finished products, saving of time and lower costs. All obtained by one operation. U. S. Reclaimed rubber gives a body to the compound which cannot be obtained solely through the use of crude rubber and compounds. Our business dates from the year 1880. Each brand used for a specific purpose.

BUFFALO	—	GRAY BUFFALO	—	HYVOLT	—	MATCHLESS
U. S. SPECIAL	—	WHITE BUFFALO	—	MOTOR BUFFALO	—	ONTARIO

R. T. VANDERBILT CO.

INCORPORATED

50 East 42nd Street, New York



HARD HYDROCARBON

—
An A1 grade at a very low price.
Uniform and satisfactory all the time.



No. 1

for use with
Zinc

No. 2

for use with
Litharge

Use either of them in any kind of a compound or cure where an accelerator is worth while.



RUBBER MAKER'S

—
Direct from producer to consumer.
The one grade being made for use exclusively in rubber.

CANADIAN WAREHOUSING

To give service to Canadian manufacturers we are now beginning to carry stocks of all our rubber compounding materials at the

TORONTO STORAGE COMPANY

17 River Street
Toronto, Ont., Canada

WAREHOUSES: Akron

Boston

Chicago

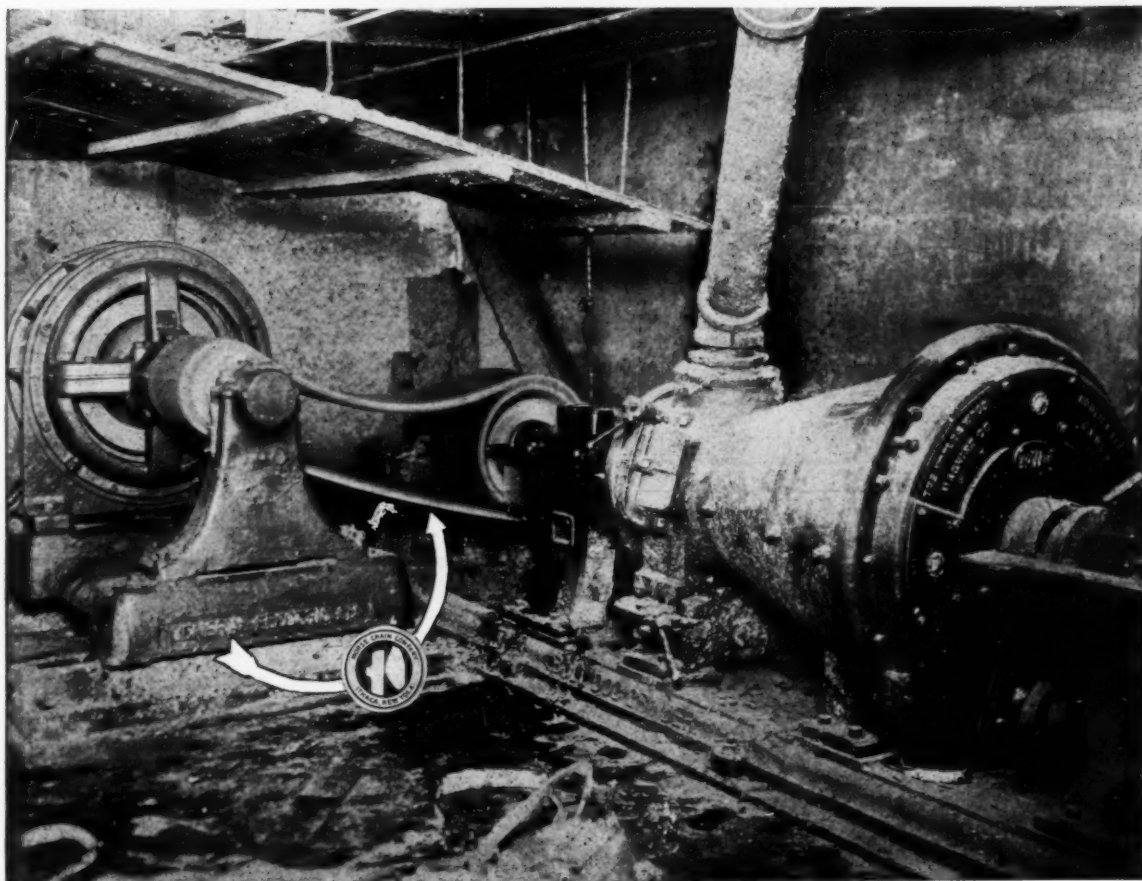
Trenton

Toronto

The Sign of Efficiency
MORSE
Positive as Gears
Longer Life

SILENT CHAIN
THE MORSE "ROCKER JOINT"

The Sign of Durability
DRIVES
Flexible as a Belt



Fifteen Morse Silent Chain Drives in Congoleum Company Mill

The illustration shows one of the fifteen Morse Silent Chain Drives in the mill of the Congoleum Company, Asbestos, Maryland, driving a Jordan engine from a 150 H.P. motor on felt stock, one of the hardest kinds of stock to refine.

This mill uses the following Morse Chain Drives:—one 150 H.P.; four 100 H.P.; nine 90 H.P.; one 75 H.P., all doing splendid work.

Morse Chains are 99% efficient, silent, durable and economical to maintain.

Where you have unusual and hard conditions from wear and exposure, Morse Silent Chains prove their greatest worth.

For driving Jordan engines, beating engines, paper machine line shafts, and for many other places in the paper mill, the ideal drive is the Morse Silent Chain.

Write today for booklet

MORSE CHAIN CO.,

Morse Engineering Service

LARGEST MANUFACTURERS OF
SILENT CHAINS IN THE WORLD

BENEFIT BY MORSE SERVICE AS OTHERS DO

ITHACA, N. Y.

Assistance Without Obligation

Address Nearest Office



ATLANTA, GA.Candler Bldg., Earl F. Scott & Co.
BALTIMORE, MD.1402 Lexington Bldg.
BOSTON, MASS.141 Milk St.
CHARLOTTE, N. C.404 Commercial Bank Bldg.
CHICAGO, ILL.Merchants L. & T. Bldg.
CLEVELAND, OHIO.Engineers Bldg.
DETROIT, MICH.1361 Abbott St.
KANSAS CITY, MO.Finance Bldg., Morse Eng'rg Co.

NEW YORK CITY.30 Church St.
MINNEAPOLIS, MINN.So. 3rd St., Strong-Scott Mfg. Co.
MONTREAL.St. Nicholas Bldg., Jones & Glasco Reg'd
PHILADELPHIA, PA.612 Franklin Trust Bldg.
PITTSBURGH, PA.Westinghouse Bldg.
SAN FRANCISCO, CAL.Monadnock Bldg.
ST. LOUIS, MO.Chemical Bldg., Morse Eng'rg Co.
TORONTO, Bank of Hamilton Bldg., Jones & Glasco Reg'd
WINNIPEG, MAN.Dufferin St., Strong-Scott Mfg. Co.

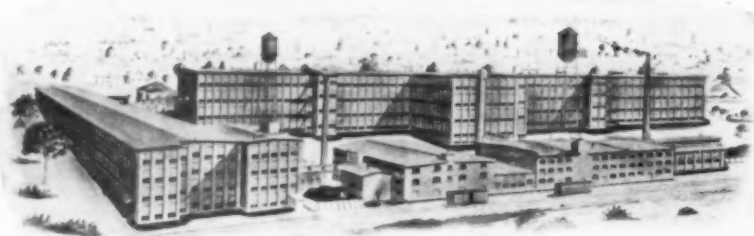


"Morse" is the Guarantee Always Behind the Efficiency, Durability and Service

ONCE—ALWAYS ASK THOSE WHO KNOW FROM 10 YEARS' USE
Peruvian, Egyptian Peeler and Arizona Square Woven and Cord TIRE FABRICS
RESISTANCE TO DISTANCE

CONNECTICUT
MILLS
COMPANY
MILLS AND
OPERATIVES'
HOMES

MILLS AT
Danielson,
Conn.;
Taunton
and Fall River,
Mass.



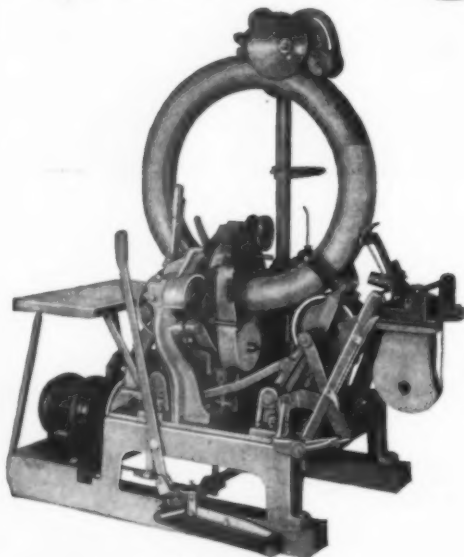
CANADIAN CONNECTICUT
COTTON MILLS, Limited
MILLS AND OPERATIVES' HOMES

Mills at
Sherbrooke, Province of
Quebec, Canada

R. J. CALDWELL, Ltd.
Oshawa Ontario
AGENTS FOR CANADA

R. J. CALDWELL COMPANY, Inc. 15 Park Row, New York

Something to Think About



Fully Patented.

Would 172 tire factories be using The Pierce Tire-wrapping Machine if The Pierce wasn't better?

Would they rent them, year after year, if this rental plan didn't save them money?

Would factories purchase other makes, then discard them in favor of The Pierce if our machine didn't give a better, neater, stronger, more economical wrap?

Statistics prove the above to be actual facts; we know.

The Pierce is making new friends daily, because it SAVES time, money, labor, material.

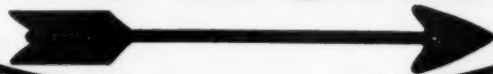
It is dependable, day after day; it is ruggedly built and does not need frequent repairs.

Ten years in the leading tire factories places The Pierce beyond the experimental stage.

More companies are using The Pierce today than ever before, and most cheerfully, too.

PIERCE WRAPPING MACHINE CO., 625 W. Jackson Blvd., Chicago, Ill.

VULCAN



**Offset Blankets
Auto Top Fabrics
Hospital Sheeting
Piano Player Cloths**

CALENDERED SHEET RUBBER

VULCAN PROOFING COMPANY

Rubberizers to the Trade

FIRST AVE. and 58th ST.

BROOKLYN, N. Y.

**WHITING
GAS CARBON BLACK
WOOD FLOUR
PRECIPITATED CHALK**

EXTRA LGHT, LIGHT & HEAVY



Write or phone for Quotations

INDUSTRIAL CHEMICAL CO.

Manufacturers

Fifth Avenue Building, New York City

Gramercy 3242

TIRE FABRICS

**SEA ISLAND—EGYPTIAN
—PEELER**

JOHN H. MEYER & CO., INC.

295 FIFTH AVE. - - - NEW YORK

J·H·LANE & CO.

announce

THE REMOVAL OF THEIR OFFICE TO
250 WEST 57th STREET

BROADWAY AND 57th STREET SOUTHWEST

TELEPHONE CIRCLE 9600
NEW YORK CITY

SEPTEMBER FIFTEEN, NINETEEN TWENTY-TWO

CHARLES T. WILSON CO., Inc.

82 Beaver Street

New York City

AKRON OFFICE: 507 Second National Building

SAN FRANCISCO OFFICE: 510 Battery Street

DIRECT IMPORTERS OF

CRUDE RUBBER

*Manufacturers' inquiry solicited
and will receive prompt attention*

THE H. F. TAINTOR MANFG. CO.

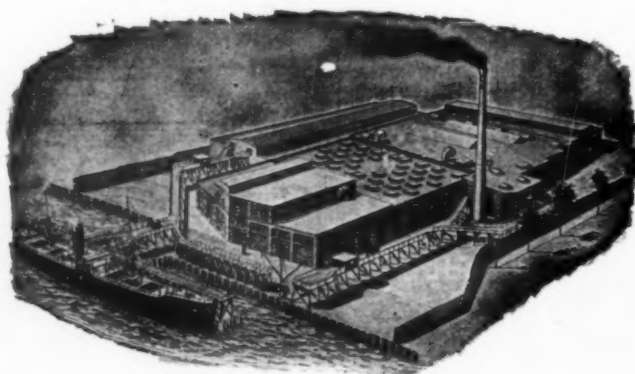
Office: No. 2 RECTOR STREET
NEW YORK

XXXXXXXXXXXXXXXXXXXX

Makers of fine

Whiting' and Paris White

Bolted English China Clay for Rubber Manufacturers



WORKS, BAYONNE, N. J.

All our whiting is made from selected English and French Chalk, and during the process of manufacture is all WATER-FLOATED, thus insuring its freedom from particles of FLINT, so prevalent in dry ground whiting. We guarantee the uniformity of our product in quality and condition.

Standard for rubber manufacturers for over thirty years. Write for samples and prices.



"National"

Thiocarbanilide

Strength . Purity . Uniformity

For a number of years "National" chemists have specialized in organic compounds for use in rubber manufacture and have perfected a group of accelerators that are so uniform in content and reaction as to establish a **standard**.

"National" Thiocarbanilide is a highly refined product developed primarily and especially for the rubber trade. In quality, strength and refinement this is superior to the ordinary commercial product.

"National" Thiocarbanilide has a constant melting point, a minimum ash and moisture content, and is free from objectionable impurities.

The National Aniline & Chemical Company, Inc., offers expert technical assistance in the application and use of its organic compounds.

Intermediates Division

National Aniline and Chemical Co., Inc.

40 Rector Street, New York

THE RUBBER PRODUCTS CO.

BARBERTON, OHIO

Stronghold
TIRES & TUBES

HIGH GRADE

Druggists' Sundries Molded Goods

TRADE



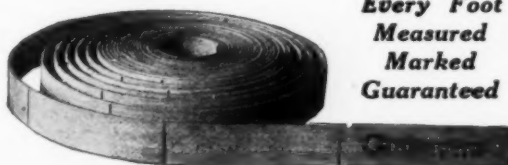
MARK

VOORHEES MECHANICAL

RUBBER GOODS
AUTOMOBILE TUBES & ACCESSORIES

JERSEY CITY NEW JERSEY

NEW YORK OFFICE 30 READE ST.



Every Foot
Measured
Marked
Guaranteed

"GLOBE" Automotive Products

"GLOBESTOS" Brake Lining

"GLOBE" Clutch Facings

"GLOBELTS" V & Flat Shape

"GLOBE" Flexible Joints

MADE BY

**UNITED & GLOBE
RUBBER CO.**

TRENTON, N. J.

Highest Quality



Personal Service

CARBON BLACK

Trade names are misleading: We offer our Unico Carbon Black for what it is, a high grade pure natural gas Carbon Black, scientifically compressed for rubber compounding.

UNION CHEMICAL CO.

Industrial Chemicals for All Purposes

27 Haymarket Square Boston, Mass.

CHAS. E. WOOD

BROKER IN

CRUDE RUBBER

AND

Washed and Dried Para Crepes

Prompt Attention and Efficient Service to Buyer and Seller Alike

NEW YORK—287 BROADWAY

Telephones Worth 5100 to 7

Cable Address—"Chasewood"

E. D. Hewins, Inc.

72 Lincoln Street, Boston, Mass.

New York Office, 280 BROADWAY

*Special Fabrics for the
Rubber Trade*

FOR THE RUBBER MANUFACTURER

We Can Supply You With

**ICE BAG CAPS
SYRINGE SHUT OFFS
BATH SPRAY HEADS**

Sheet Metal Specialties and Brass Fittings for Rubber Goods of Every Description.

BRASS GOODS MANUFACTURING CO.

341 Eldert St.

Brooklyn, N. Y.

CLAFLIN

We provide not only molds, cores and equipment that is unexcelled in accuracy, uniformity and service, but the unmatched counsel of engineers who know tire making in every detail.

THE CLAFLIN ENGINEERING COMPANY
LANCASTER OHIO

TRENTON
N. J., U. S. A.

ESSEX RUBBER COMPANY

TRENTON
N. J., U. S. A.

INCORPORATED

"ERCO" SOLES
"ESSEX" RUBBER HEELS
"TITE-EDGE" RUBBER HEELS
MOLDED SPECIALTIES



AUTOMOBILE
ACCESSORIES
INNER TUBES,
CEMENTS, ETC.

MOLDED RUBBER GOODS

Our Publicity Page

Advertising—The Motive Power of Business

Don't Cut Off the Engine

THE story is being told of a very significant little conversation which occurred recently between William Wrigley, the famous chewing gum manufacturer, and one of his fellow passengers who had scraped acquaintance with him on a train.

"Pardon me, Mr. Wrigley," said the man, "but do you know you're wasting a lot of money?"

Always anxious to learn anything about his own business, Mr. Wrigley asked him how.

"Why, in advertising," the man replied. "Your product is so well known now you don't need to advertise!"

"My good man," Mr. Wrigley answered, "do you know what would happen if we were to cut the engine off from this train?"

"The train would coast along a while and then stop, I suppose."

"Exactly," replied Mr. Wrigley, "and that's just what my business would do if I cut off the advertising. Advertising is the engine that furnishes the motive power for my business."

The Value of Acquaintance

This is the attitude taken by all leaders in the business world because they appreciate the value of national prestige, acquaintance and friendship and realize that building good will through the printed word is accumulating an asset and a sound form of business insurance. Good advertising in the right medium does sell goods, but of even greater importance it gets people acquainted with these goods. Advertising accomplishes for a community what social activity does for the individual.

Non-Advertised Goods Virtually Non-Existent

The world is so big that every person lives in a little community of his own, peopled by his own circle of friends

and supplied with products which he has seen or read about. Thus advertising enlarges your circle of friends, makes people know your goods and regard them with favor. It influences them to buy certain materials, products and devices which they know something about because they have become acquaintances among a group of strangers. To them non-advertised goods do not exist.

Advertising the Measure of Your Activities

An advertisement is primarily a letter of introduction, and secondarily a salesman. It makes new friends and holds old ones. It is the measure of the impression your business activity is making on your market. To stop advertising is to stop greeting your friends and making new ones. Advertising or not, is not merely a question of selling goods or not. It is a question of how many possible buyers know that the thing you make exists, so that when the path of their needs crosses the path of your supply they will at once think of you as an old acquaintance.

India Rubber World Advertising in Particular

Over 325 leading business houses are using INDIA RUBBER WORLD advertising as the principal point of contact with buyers of their products everywhere. Most of them have been advertisers in our pages for many years. Our index to advertisers reads like a directory of the rubber and allied trades, indicating that THE INDIA RUBBER WORLD is the most representative advertising medium in its field. As compared with its principal contemporary it has over 84 per cent more advertisers, who occupy over 38 per cent more space at higher rates because of wider circulation. Can anything prove more conclusively that INDIA RUBBER WORLD advertising is an asset of friendship with your market and the motive power of your business? The proper measure of the possible friendship of the rubber and allied trades for your goods is the proper measure of the power of INDIA RUBBER WORLD advertising for your firm.

Core and Mold Equipment

MECHANICAL MOLDS

SPECIAL MACHINES

GEARS AND GEAR CUTTING



The Akron Gear & Engineering Company

Cor. South & High Sts.

AKRON, OHIO



Small Advertisement Department

SITUATIONS WANTED

FACTORY MANAGER: TECHNICAL GRADUATE, AGE 35, with several years' experience in the manufacture of high grade tires and tubes, desires new connection with a well financed firm in Ohio. Address Box No. 6116, care of The India Rubber World.

A SALESMAN WITH 10 YEARS' EXPERIENCE IN ALL lines of mechanical goods, desires to connect with a firm whose quality of product, liberal sales policy and service to the trade will allow the advertiser to demonstrate his ability. The opportunities offered for the future rather than the immediate salary are desired. Address Box No. 6115, care of The India Rubber World.

MILL AND CALENDER ROOM SUPERINTENDENT, AT PRESENT employed, wishes to make a permanent connection with a reliable company. Ten years' experience in tires, tubes and mechanical goods. Salary secondary consideration to opportunity. Address Box No. 6114, care of THE INDIA RUBBER WORLD.

WANTED: SUPERINTENDENT'S POSITION IN TIRE AND TUBE factory. Address Box No. 6113, care of THE INDIA RUBBER WORLD.

SUPERINTENDENT, TWENTY YEARS' PRACTICAL EXPERIENCE with several leading companies in all phases of rubber manufacturing: hard rubber goods; dipped, hand made and molded druggists' sundries; molded mechanicals and miscellaneous goods of every description; dentists' and stationers' supplies; tire repair stocks, etc. Thorough and accurate knowledge of details processes, costs and compounds. Write if you are in need of a practical man. Address Box No. 6105, care of THE INDIA RUBBER WORLD.

GENERAL FOREMAN, MILL AND CALENDER DEPARTMENT, AT present connected, would like to make a change. Practical in all branches of mixing, milling and calender work. An A-1 production man, also an expert in handling help. Address Box No. 6112, care of THE INDIA RUBBER WORLD.

CAPABLE, EXPERIENCED TIRE AND TUBE SUPER-intendent seeks a new connection with some reliable concern. For details and references write Box No. 6111, care of The India Rubber World.

FACTORY SUPERINTENDENT WITH 15 YEARS' EXPERIENCE in the manufacture of soles, heels, molded goods, hard rubber, calender and spreader coating with experience with both dry and vapor cure. At present employed. Wishes to make a permanent connection with a growing company. Address Box No. 6125, care of THE INDIA RUBBER WORLD.

TECHNICAL HARD RUBBER ENGINEER, EXPE-rienced in compounds and processes for producing all kinds of hard rubber goods by most modern methods and at the lowest possible cost. Can install complete department and capably manage same. At present with large quality manufacturer in this line. Address Box No. 6109, care of The India Rubber World.

PRODUCTION CONTROL ON RUBBER GOODS. TECH-nical graduate with 7 years of mechanical and industrial engineering experience in the tire, tube and other rubber goods manufacture lines and with successful assistant experience in the establishment of production control in a tire plant, desires position with the engineering department of a stable rubber concern. Address Box No. 6108, care of The India Rubber World.

ASSISTANT SUPERINTENDENT WITH 15 YEARS' EXPERIENCE and technical training, practical in all lines of mechanical goods and with a thorough knowledge of mills and calenders, would like to hear from an up-to-date company looking for a live wire production man. At present connected. Address Box No. 6124, care of THE INDIA RUBBER WORLD.

SALES MANAGER SOLES AND HEELS with successful merchandising record, capable of directing and obtaining a large volume of rubber heel business and who has entire to both the shoe manufacturing and findings trade. Will negotiate with a company desiring to get into this field. Address Box No. 6107, care of THE INDIA RUBBER WORLD.

RUBBER HEEL MAN CAPABLE OF MANAGING plant from compound to shipping room and getting results with practical methods, desires position as superintendent or manager, preferably with a far or middle-west concern. At present employed but desirous of making a change. Twenty-six years old, married. Address Box No. 6110, care of The India Rubber World.

SITUATIONS WANTED—Continued

SALES OR GENERAL MANAGER

Executive Sales Manager, fifteen years' experience in tires and tubes with creditable record. Very finest references, familiar with trade and conditions, costs and policies; has doubled sales in past year. Knows exporting, organizing and business economy. At present employed, is seeking change and desires to communicate with reputable progressive company, where results are appreciated. Address Box No. 6127, care of THE INDIA RUBBER WORLD.

WANTED: POSITION AS FOREMAN IN PRESSROOM BY PRACTICAL man. Years of experience, druggists' and plumbers' molded sundries, also hollow blown goods of all kinds. Address Box No. 6138, care of THE INDIA RUBBER WORLD.

MILL ROOM AND CALENDER FOREMAN. ENERGETIC AND GOOD handler of help. Has some laboratory experience. Address Box No. 6132, care of THE INDIA RUBBER WORLD.

SALESMAN DESIRES CONNECTION WITH FACTORY MANUFAC-turing automobile tires and tubes. Best of references and experience. Address Box No. 6143, care of THE INDIA RUBBER WORLD.

BOOT AND SHOE FOREMAN, EXPERIENCED CUTTING ROOM and shoe room man, also 4 years' pattern making and designing. Address Box No. 6140, care of THE INDIA RUBBER WORLD.

POSITION WANTED BY MAN WITH GOOD PRACTICAL EXPERI-ence in mill and calender work and also familiar with compound and mixing departments. Now employed, but desirous of making a change. Address Box No. 6129, care of THE INDIA RUBBER WORLD.

CHIEF ENGINEER OR MASTER MECHANIC NOW DISENGAGED, desires position. Has had 25 years' practical experience with some well-known rubber factories, capable of laying out and installing additional plant, maintenance of present plant, designing and making of molds for all classes of goods. Last position 15 years. First class references. Address Box No. 6135, care of THE INDIA RUBBER WORLD.

SITUATIONS OPEN

PRACTICAL MECHANICAL MAN, PREFERABLY WITH SOME CAP-ital, to take complete technical charge in small new concern making cut and molded specialties near New York City. State experience. Address Box No. 6117, care of THE INDIA RUBBER WORLD.

WANTED: A FIRST CLASS MAN TO TAKE ENTIRE CHARGE OF tube department in tire factory making 2,000 tubes per day. Must know all details of the work and be a good handler of help. Address Box No. 6121, care of THE INDIA RUBBER WORLD.

FOREMAN WANTED: EXPERIENCED IN STRANDING BARE AND tinned copper wire and familiar with both Larmuth and planetary type stranding and cabling machines. Must also have had experience in the manufacture of both rubber and paper insulated wire and cables for telephone, telegraph and power work for aerial, underground, and submarine uses. Must also be familiar with strip insulating and vulcanizing. Good position and salary to a man who can show unquestionable qualifications in every respect. Address Box No. 6120, care of THE INDIA RUBBER WORLD.

CLOTHING DIVISION HEAD

Wanted a practical and thoroughly experienced man to take full charge of designing, cutting and make up of calendered clothing single and double texture mackintoshes. Old established business located New York City. State in detail qualifications, experience, salary requirements, etc. Address Box 669, 110 West 40th street, Room 2503, New York City.

WANTED: SALESMAN TO HANDLE LINE OF HIGH CLASS mechanical rubber goods, automobile rubber accessories and shoe heels in the following cities: New York City, New Orleans, St. Louis, Indianapolis, Chicago, Kansas City, Denver, San Francisco. Address Box No. 6119, care of THE INDIA RUBBER WORLD.

RUBBER MANUFACTURING CONCERN DESIROUS OF SECURING the services of rubber chemist and calender man experienced in the manufacture of air brake hose and specification mechanical rubber goods. Excellent opportunity for chemist wishing to make permanent connection. Replies strictly confidential. Address Box No. 6118, care of THE INDIA RUBBER WORLD.

(Advertisements continued on page 64)

"Factice is one of the component parts of good rubber goods, and should be used as such in order to obtain certain results in conjunction with rubber."—

Extract from "Factice."



Bibb Manufacturing Co.

Macon, Ga.

TIRE FABRICS OF QUALITY

M. NORTON & COMPANY
MEDFORD, MASS.

New, Old, Cured and Uncured Scrap Rubber
ALL KINDS SECOND HAND RUBBER
MIL MACHINERY BOUGHT AND SOLD
Office and Warehouse, Locust Street, Medford, Mass.

WILMER DUNBAR
Consulting Rubber Engineer
GREENSBURG, PA.

RUBBERIZERS OF FABRICS
Spread and Calender Work for the Trade
EUREKA RUBBER MANUFACTURING CO.
Pierce, 8th and 9th Avenues Long Island City

JAMES E. ODELL
Broker in
**Crude Rubber, Gutta-Percha
and Allied Gums**
RECLAIMED RUBBER
200 Devonshire St. Boston, Mass.

COLONIAL PORCELAIN VITREOUS FORMS



The only porcelain forms
manufactured for dipping
Rubber Goods which do not
crack when passing through
either steam or acid cure.

Made by

Colonial Sign and Insulator Co., Akron, Ohio

New York Agents
**WADLEIGH
COMMERCIAL, LTD.**
Singapore, S. S.

ARTHUR W. STEDMAN, Inc.
CRUDE RUBBER BROKERS
90 West Street, New York

CODE ADDRESS
"ALSTED NEW YORK"
CODES:
A B C 5th EDITION, BENTLEY'S

Small Advertisement Department—Continued

SITUATIONS OPEN—Continued

WANTED: A FOREMAN IN PRESS DEPARTMENT. MUST BE AN energetic young man thoroughly experienced along the line of small molded articles. Address Box No. 6135, care of THE INDIA RUBBER WORLD.

WANTED: EXPERIENCED MAN AS EXECUTIVE IN CHARGE OF rubber coating plant. Address Box No. 6074, care of THE INDIA RUBBER WORLD.

WANTED: GOOD CALENDER MAN TO TAKE CHARGE OF MILL and calender departments of tire and tube factory. Must know how to operate a tubing machine. Excellent chances for advancement. Address Box No. 6137, care of THE INDIA RUBBER WORLD.

WANTED: FOREMAN FOR DIPPED GOODS PLANT IN NEW JERSEY. Address Box No. 6134, care of THE INDIA RUBBER WORLD.

BUSINESS OPPORTUNITIES

FOR SALE: MODERN DAYLIGHT RUBBER FACTORY NEAR NEW York. Equipped for making mechanical and molded goods, rubber heels, etc. Good labor market. Address Box No. 6128, care of THE INDIA RUBBER WORLD.

WE SHOULD LIKE TO HEAR FROM RUBBER MANUFACTURERS who are interested in a patented process and apparatus for reclaiming waste rubber of quality. Also from parties who are interested in promoting new rubber companies. Rubber Compound Bureau, 727 Second National Building, Akron, Ohio.

BUSINESS OPPORTUNITIES—Continued

WANTED: TO BUY OR LEASE A TIRE FACTORY. ADDRESS Henry Cord Tire Co., Akron, Ohio.

WANTED: TO GET IN TOUCH WITH RUBBER TIRE PLANT JUST getting started, with a view of contracting for output. Address Box No. 6125, care of THE INDIA RUBBER WORLD.

BALLOONS: AN OLD ESTABLISHED ENGLISH BALLOON, squeaker and rubber novelty manufacturer, doing business with all leading buyers in Great Britain, requires sole agency for American firm making molded goods. Thos. Dowler & Co., Limited, Stockport, England.

French Rubber Factories FOR SALE

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The rate of exchange being in your favor, this is the time for you to acquire these factories under the most advantageous conditions.

IMPORTANT NOTICE

During the first eight months of 1920 rubber goods to the value of 184,940,000 fr. were imported into France.

This was an average of 23,117,500 fr. per month.

Of this total

100,000,000 fr. came from England.

52,000,000 fr. came from America.

32,940,000 fr. came from Belgium, Italy and other countries.

A. D. CILLARD — Directeur de la Revue —
"Le Caoutchouc et la Gutta-Percha"
49, RUE DES VINAIGRIERS, PARIS, Xme.

Sale by Trustee in Bankruptcy OF The Rotary Tire and Rubber Company ZANESVILLE, OHIO

Under order of the United States District Court, for the Southern District of Ohio, Eastern Division, Guy R. Winegarner, Trustee in Bankruptcy, will offer at public sale, all of the tangible property and assets of The Rotary Tire and Rubber Company, bankrupt, consisting of ten (10) acres of land, and the buildings, machinery, equipment and supplies situated one (1) mile west of Zanesville, Ohio, abutting on the rights of way of The Baltimore and Ohio Railway Company and The Ohio Electric Railway Company and also upon the Licking River.

The above plant is complete and can be almost immediately opened and operated for the manufacture of automobile tires and tubes.

Said sale will be held in the office of the plant on Friday, the 15th day of September, 1922, at 10:00 o'clock A. M., Central Standard Time. Said property will be offered separately or as a whole, all bids subject to approval of the Court; the total appraised value of the property, as made under order of the Court is \$118,790.80.

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Location: BUFFALO—within 24 hours' ride of over one-half the country's population.

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Power Plant: Complete—1,000 h. p.

Equipment: Equipped to manufacture 1,000 tires a day.

Siding: N. Y. Central.

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Buffalo's natural resources lend themselves to greater economic tire production than is enjoyed by any of the tire manufacturing centers of the country. Water power and labor costs are very low. Fifteen trunk lines enter the city which gives excellent rail and water shipping facilities.

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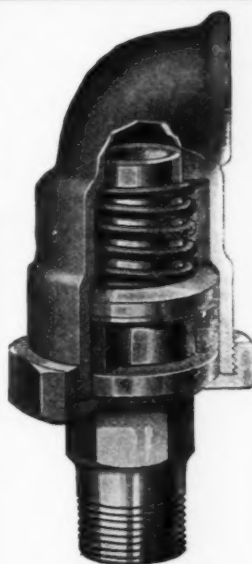
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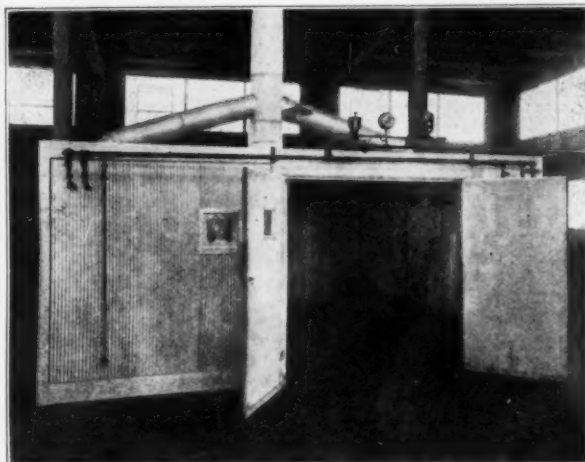
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Canfield Co., H. O., Bridgeport, Conn.
Canfield Rubber Co., Bridgeport, Conn.
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New York Rubber Co., New York.
North British Rubber Co., Ltd., Edinburgh, Scotland.
Quaker City Rubber Co., Phila., Pa.
Rubber Products Co., Barberton, Ohio.
Siola Rubber Mfg. Co., Inc., The, New York.
Stokes, Jos., Rubber Co., Trenton, N. J.

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United States Rubber Co., New York.
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Western Rubber Co., Goshen, Ind.
Whitehead Bros. Rubber Co., Trenton, N. J.
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Siola Rubber Mfg. Co., Inc., The, New York.
United States Rubber Co., New York.
Voorhees Rubber Mfg. Co., Jersey City.
Western Rubber Co., Goshen, Ind.

Door Springs.

Canfield Rubber Co., Bridgeport, Conn.
Manhattan Rubber Mfg. Co., Passaic, N. J.
North British Rubber Co., Ltd., Edinburgh, Scotland.
Siola Rubber Mfg. Co., Inc., The, New York.

Experimental Work.

Manhattan Rubber Mfg. Co., Passaic, N. J.
Siola Rubber Mfg. Co., Inc., The, New York.

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Acme Rubber Mfg. Co., Trenton, N. J.
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Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
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Cincinnati Rubber Mfg. Co., Cincinnati, Ohio.
Goodyear Rubber Co., New York.
Gutta Percha and Rubber, Limited, Toronto, Canada.
Manhattan Rubber Mfg. Co., Passaic, N. J.
New York Belting & Packing Co., N. Y.
North British Rubber Co., Ltd., Edinburgh, Scotland.
Rubber Products Co., Barberton, O.
Siola Rubber Mfg. Co., Inc., The, New York.
United States Rubber Co., New York.
Western Rubber Co., Goshen, Ind.

Gas-Bags (Rubber).

Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Daval Rubber Co., Providence, R. I.
Hodgman Rubber Co., New York.
North British Rubber Co., Ltd., Edinburgh, Scotland.
Seamless Rubber Co., Inc., The, New Haven, Conn.
Tyer Rubber Co., Andover, Mass.
Voorhees Rubber Mfg. Co., Jersey City.

Gaskets, Gasket Rings, Tubing and Washers.

Boston Belting Co., Boston, Mass.
Boston Woven Hose & Rubber Co., Cambridge, Mass.
Buckeye Rubber Products Co., The, Willoughby, Ohio.

Gaskets, Gasket Rings, Tubing and Washers—Continued.

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Essex Rubber Co., Trenton, N. J.
Goodyear Rubber Co., New York.
Gutta Percha & Rubber Mfg. Co., New York.
Gutta Percha & Rubber, Ltd., Toronto, Canada.
Hewitt Rubber Co., Buffalo, N. Y.
Home Rubber Co., Trenton, N. J.
Manhattan Rubber Mfg. Co., Passaic, N. J.
New York Belting & Packing Co., New York.
New York Rubber Co., New York.
North British Rubber Co., Ltd., Edinburgh, Scotland.
Quaker City Rubber Co., Philadelphia, Pa.
Siola Rubber Mfg. Co., Inc., The, New York.
United & Globe Rubber Co., Trenton, N. J.
United States Rubber Co., New York.
Voorhees Rubber Mfg. Co., Jersey City, N. J.
Western Rubber Co., Goshen, Ind.

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Cincinnati Rubber Mfg. Co., Cincinnati, Ohio.
Gutta Percha and Rubber, Limited, Toronto, Canada.

Hat Bags.

Boston Belting Co., Boston, Mass.
Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Manhattan Rubber Mfg. Co., Passaic, N. J.
New York Belting & Packing Co., N. Y.
United States Rubber Co., New York.
Voorhees Rubber Mfg. Co., Jersey City.

Horse Shoe Pads.

Buckeye Rubber Products Co., The, Willoughby, Ohio.
Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Essex Rubber Co., Trenton, N. J.
North British Rubber Co., Ltd., Edinburgh, Scotland.
Western Rubber Co., Goshen, Ind.

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Dixon Valve & Coupling Co., Philadelphia, Pa.
Goodyear Rubber Co., New York.
Manhattan Rubber Mfg. Co., Passaic, N. J.
Western Rubber Co., Goshen, Ind.
Yerdon, William, Fort Plain, N. Y.

Hose—Armored.

Woven Steel Hose & Rubber Co., Trenton, N. J.

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Vacuum, Dredging Sleeves.
Acme Rubber Mfg. Co., Trenton, N. J.
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Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.

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Gutta Percha & Rubber, Ltd., Toronto.
Hewitt Rubber Co., Buffalo, N. Y.
Home Rubber Co., Trenton, N. J.
Manhattan Rubber Mfg. Co., Passaic, N. J.
New York Belting & Packing Co., New York.
North British Rubber Co., Ltd., Edinburgh, Scotland.
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Thermoid Rubber Co., Trenton, N. J.
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Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
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Fabric Fire Hose Co., New York.
Goodyear Rubber Co., New York.
Gutta Percha & Rubber Mfg. Co., N. Y.
Gutta Percha and Rubber, Limited, Toronto, Canada.
Hewitt Rubber Co., Buffalo, N. Y.
Home Rubber Co., Trenton, N. J.
Manhattan Rubber Mfg. Co., Passaic, N. J.
New York Belting & Packing Co., N. Y.
New York Rubber Co., New York.
North British Rubber Co., Ltd., Edinburgh, Scotland.
Quaker City Rubber Co., Philadelphia, Pa.
Stokes, Jos., Rubber Co., Trenton, N. J.
United & Globe Rubber Co., Trenton, N. J.
United States Rubber Co., New York.
Voorhees Rubber Mfg. Co., Jersey City, N. J.
Whitehead Bros. Rubber Co., Trenton, N. J.
Woven Steel Hose & Rubber Co., Trenton, N. J.

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Boston Belting Co., Boston, Mass.
Boston Woven Hose & Rubber Co., Cambridge, Mass.
Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Gutta Percha and Rubber, Limited, Toronto, Canada.
Manhattan Rubber Mfg. Co., Passaic, N. J.

Hose Linings—Continued.

New York Belting & Packing Co., New York.
Quaker City Rubber Co., Philadelphia.
United States Rubber Co., New York.
Voorhees Rubber Mfg. Co., Jersey City.

Lawn Sprinklers.

Boston Woven Hose & Rubber Co., Cambridge, Mass.
Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.

Mallets (Rubber).

Boston Belting Co., Boston, Mass.
Buckeye Rubber Products Co., The, Willoughby, Ohio.
Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Gutta Percha and Rubber, Limited, Toronto, Canada.
Manhattan Rubber Mfg. Co., Passaic, N. J.
New York Belting & Packing Co., N. Y.
North British Rubber Co., Ltd., Edinburgh, Scotland.
Quaker City Rubber Co., Philadelphia, Pa.
United States Rubber Co., New York.
Voorhees Rubber Mfg. Co., Jersey City, N. J.
Western Rubber Co., Goshen, Ind.

Matting—Carriage Mats and Stair Treads.

Acme Rubber Mfg. Co., Trenton, N. J.
Boston Belting Co., Boston, Mass.
Boston Woven Hose & Rubber Co., Cambridge, Mass.
Buckeye Rubber Products Co., The, Willoughby, Ohio.
Cambridge Rubber Co., Cambridge, Mass.
Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Cincinnati R. M. Co., Cincinnati, O.
Essex Rubber Co., Trenton, N. J.

Matting—Carriage Mats and Stair Treads—Continued.

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Gutta Percha & Rubber, Ltd., Toronto, Canada.
Home Rubber Co., Trenton, N. J.
Manhattan Rubber Mfg. Co., Passaic, N. J.
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New York Rubber Co., New York.
North British Rubber Co., Ltd., Edinburgh, Scotland.
Quaker City Rubber Co., Philadelphia, Pa.
Siola Rubber Mfg. Co., Inc., The, New York.
United States Rubber Co., New York.
Voorhees Rubber Mfg. Co., Jersey City.
Western Rubber Co., Goshen, Ind.

Mold Work.

(See Mechanical Rubber Goods.)

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Boston Belting Co., Boston, Mass.
Buckeye Rubber Products Co., The, Willoughby, Ohio.
Cambridge Rubber Co., Cambridge, Mass.
Canfield, H. O., Co., Bridgeport, Conn.
Cincinnati Rubber Co., Cincinnati, O.
Cincinnati R. M. Co., Cincinnati, O.
Davidson Rubber Co., Boston, Mass.
Davol Rubber Co., Providence, R. I.
Elkhart Rubber Works, Elkhart, Ind.
Essex Rubber Co., Trenton, N. J.
Firestone Tire & Rubber Co., Akron, O.
Goodyear Rubber Co., New York.
Gutta Percha & Rubber Mfg. Co., New York.
Gutta Percha & Rubber, Ltd., Toronto.
Hale, Alfred, Rubber Co., Atlantic, Mass.
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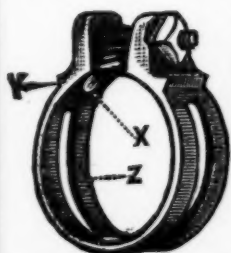
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 New York Belting & Packing Co., N. Y.
 Quaker City Rubber Co., Philadelphia, Pa.
 United & Globe Rubber Co., Trenton, N. J.
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 Western Rubber Co., Goshen, Ind.

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(See Mechanical Rubber Goods.)

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 Essex Rubber Co., Trenton, N. J.
 Goodyear Rubber Co., New York.
 Gutta Percha & Rubber Mfg. Co., New York.
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 Hewitt Rubber Co., Buffalo, N. Y.
 Home Rubber Co., Trenton, N. J.
 Manhattan Rubber Mfg. Co., Passaic, N. J.
 New York Belting & Packing Co., New York.
 North British Rubber Co., Ltd., Edinburgh, Scotland.
 Quaker City Rubber Co., Philadelphia, Pa.
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 United & Globe Rubber Co., Trenton, N. J.
 United States Rubber Co., New York.
 Voorhees Rubber Mfg. Co., Jersey City, N. J.
 Western Rubber Co., Goshen, Ind.
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 Manhattan Rubber Mfg. Co., Passaic, N. J.
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 Canfield Rubber Co., Bridgeport, Conn.
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 Rubber Products Co., Barborton, O.
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 United States Rubber Co., New York.
 Voorhees Rubber Mfg. Co., Jersey City, N. J.
 Western Rubber Co., Goshen, Ind.

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 Boston Belting Co., Boston, Mass.
 Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
 Cincinnati R. M. Co., Cincinnati, O.
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 Gutta Percha and Rubber, Limited, Toronto, Canada.
 Home Rubber Co., Trenton, N. J.
 Manhattan Rubber Mfg. Co., Passaic, N. J.
 New York Belting & Packing Co., N. Y.
 North British Rubber Co., Ltd., Edinburgh, Scotland.
 Quaker City Rubber Co., Philadelphia, Pa.
 United States Rubber Co., New York.
 Voorhees Rubber Mfg. Co., Jersey City, N. J.
 Western Rubber Co., Goshen, Ind.

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 Canfield Rubber Co., Bridgeport, Conn.
 Manhattan Rubber Mfg. Co., Passaic, N. J.
 Siola Rubber Mfg. Co., Inc., The, New York.
 Western Rubber Co., Goshen, Ind.

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 Siola Rubber Mfg. Co., Inc., The, New York.

Tiling.

Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
 Goodyear Rubber Co., New York.
 Gutta Percha and Rubber, Limited, Toronto, Canada.
 Hewitt Rubber Co., Buffalo, N. Y.
 New York Belting & Packing Co., N. Y.
 North British Rubber Co., Ltd., Edinburgh, Scotland.

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United & Globe Rubber Co., Trenton, N. J.
 Western Rubber Co., Goshen, Ind.

Tubing.

(See Mechanical Rubber Goods.)

Acme Rubber Mfg. Co., Trenton, N. J.
 American Hard Rubber Co., New York.
 Boston Belting Co., Boston, Mass.
 Boston Woven Hose & Rubber Co., Cambridge, Mass.
 Buckeye Rubber Products Co., The, Willoughby, Ohio.
 Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
 Canfield Rubber Co., Bridgeport, Conn.
 Cincinnati R. M. Co., Cincinnati, O.
 Davidson Rubber Co., Boston, Mass.
 Davol Rubber Co., Providence, R. I.
 Essex Rubber Co., Trenton, N. J.
 Faultless Rubber Co., Ashland, Ohio.
 Goodyear Rubber Co., New York.
 Gutta Percha & Rubber Mfg. Co., New York.
 Gutta Percha & Rubber, Ltd., Toronto, Canada.
 Hodgman Rubber Co., New York.
 Home Rubber Co., Trenton, N. J.
 Manhattan Rubber Mfg. Co., Passaic, N. J.
 New York Belting & Packing Co., New York.
 North British Rubber Co., Ltd., Edinburgh, Scotland.
 Quaker City Rubber Co., Philadelphia, Pa.
 Rubber Products Co., Barborton, O.
 Seamless Rubber Co., Inc., The, New Haven, Conn.
 Siola Rubber Mfg. Co., Inc., The, New York.
 Tye Rubber Co., Andover, Mass.
 United & Globe Rubber Co., Trenton, N. J.
 United States Rubber Co., New York.
 Voorhees Rubber Mfg. Co., Jersey City, N. J.
 Western Rubber Co., Goshen, Ind.
 Whittall Tatum Co., New York.
 Whitehead Bros. Rubber Co., Trenton, N. J.

Valve Discs.

American Hard Rubber Co., New York.
 Boston Belting Co., Boston, Mass.
 Buckeye Rubber Products Co., The, Willoughby, Ohio.
 Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
 Canfield Rubber Co., Bridgeport, Conn.
 Cincinnati R. M. Co., Cincinnati, O.
 Goodyear Rubber Co., New York.
 Gutta Percha and Rubber, Limited, Toronto, Canada.
 Hewitt Rubber Co., Buffalo, N. Y.
 Home Rubber Co., Trenton, N. J.
 Manhattan Rubber Mfg. Co., Passaic, N. J.
 New York Belting & Packing Co., N. Y.
 North British Rubber Co., Ltd., Edinburgh, Scotland.
 Quaker City Rubber Co., Philadelphia, Pa.
 Seamless Rubber Co., Inc., The, New Haven, Conn.
 Siola Rubber Mfg. Co., Inc., The, New York.
 United States Rubber Co., New York.
 Western Rubber Co., Goshen, Ind.

Valves.

(See Mechanical Rubber Goods.)

Boston Belting Co., Boston, Mass.
 Buckeye Rubber Products Co., The, Willoughby, Ohio.
 Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
 Canfield Rubber Co., Bridgeport, Conn.
 Elkhart Rubber Works, Elkhart, Ind.
 Essex Rubber Co., Trenton, N. J.
 Goodyear Rubber Co., New York.
 Gutta Percha & Rubber Mfg. Co., New York.
 Gutta Percha and Rubber, Limited, Toronto, Canada.
 Hewitt Rubber Co., Buffalo, N. Y.
 Manhattan Rubber Mfg. Co., Passaic, N. J.
 New York Belting & Packing Co., New York.
 New York Rubber Co., New York.

Valves—Continued.

North British Rubber Co., Ltd., Edinburgh, Scotland.
 Quaker City Rubber Co., Philadelphia, Pa.
 Siola Rubber Mfg. Co., Inc., The, New York.
 United & Globe Rubber Co., Trenton, N. J.
 United States Rubber Co., New York.
 Western Rubber Co., Goshen, Ind.
 Voorhees Rubber Mfg. Co., Jersey City, N. J.
 Whitehead Bros. Rubber Co., Trenton, N. J.

Valves—Balata.

Boston Belting Co., Boston, Mass.

Valves, Balls—Condensor, Cold and Hot Water.

Boston Belting Co., Boston, Mass.
 Buckeye Rubber Products Co., The, Willoughby, Ohio.
 Goodyear Rubber Co., New York.
 Hewitt Rubber Co., Buffalo, N. Y.
 Home Rubber Co., Trenton, N. J.
 North British Rubber Co., Ltd., Edinburgh, Scotland.
 Quaker City Rubber Co., Philadelphia, Pa.
 Siola Rubber Mfg. Co., Inc., The, New York.
 Western Rubber Co., Goshen, Ind.

Vulcanized Emery Wheels.

Manhattan Rubber Mfg. Co., Passaic, N. J.
 New York Belting & Packing Co., New York.
 United States Rubber Co., New York.

Wringer Rolls.

Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
 Cincinnati R. M. Co., Cincinnati, O.
 Gutta Percha and Rubber, Limited, Toronto, Canada.
 New York Belting & Packing Co., N. Y.
 North British Rubber Co., Ltd., Edinburgh, Scotland.
 United States Rubber Co., New York.
 Western Rubber Co., Goshen, Ind.

DRUGGISTS' AND STATIONERS' SUNDRIES.**Atomizers.**

Bandages.
 Bulbs.

Nipples.

Syringes.
 Water Bottles.

Druggists' Sundries, Generally.

American Hard Rubber Co., New York.
 Boston Woven Hose & Rubber Co., Cambridge, Mass.
 Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
 Davidson Rubber Co., Boston, Mass.
 Davol Rubber Co., Providence, R. I.
 Faultless Rubber Co., Ashland, Ohio.
 Goodyear Rubber Co., New York.
 Hodgman Rubber Co., New York.
 North British Rubber Co., Ltd., Edinburgh, Scotland.
 Pirelli, Milan, Italy.
 Rubber Products Co., Barborton, O.
 Seamless Rubber Co., Inc., New Haven, Conn.
 Siola Rubber Mfg. Co., Inc., The, New York.
 Tye Rubber Co., Andover, Mass.
 United States Rubber Co., New York.
 Vulcanized Rubber Co., New York.
 Wade, Levi C., Lynn, Mass.
 Whittall Tatum Co., New York.

Air Goods.

Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
 Davol Rubber Co., Providence, R. I.
 Goodyear Rubber Co., New York.
 Hodgman Rubber Co., New York.
 North British Rubber Co., Ltd., Edinburgh, Scotland.
 Seamless Rubber Co., Inc., New Haven, Conn.
 Siola Rubber Mfg. Co., Inc., The, New York.
 Tye Rubber Co., Andover, Mass.
 United States Rubber Co., New York.
 Whittall Tatum Co., N. Y.



3,000 Times as far as Paul Revere Rode

This tire went 30,000 miles. It wore down through tread, breaker-strip and cushion, without blow-out, and without a sign of separation. Such long wear and permanent adhesion is due to the high content of

HORSE HEAD ZINC OXIDE

in cushion, breaker-strip and tread, the percentage in the tread running as high as 57% by weight.

THE NEW JERSEY ZINC COMPANY

160 Front Street

(Established 1848)

New York City

Manufacturers of

Zinc Oxide, Albalith, Zinc Dust, Slab Zinc, Rolled Zinc, Spiegeleisen, C. P. Metallic Zinc, Zinc Sulphate, Mossy Zinc, Feathered Zinc, Sulphuric Acid, Salt Cake, Zinc Chloride

CHICAGO:

Mineral Point Zinc Company
1111 Marquette Building

PITTSBURGH:

The New Jersey Zinc Sales Co.
1439 Oliver Building



CLEVELAND:

The New Jersey Zinc Sales Co.
1138 Guardian Building

SAN FRANCISCO:

The New Jersey Zinc Sales Co.
1205 Merchants Exchange Bldg.

The World's Standard for Zinc Products

RUBBER BUYERS' DIRECTORY—Continued.

Air Goods—Valves for.
Schrader's, A. Son, Inc., New York.

Balloons (Toy).

Faultless Rubber Co., Ashland, Ohio.

Balls, Dolls and Toys.

Canadian Consolidated Rubber Co., Ltd., Montreal, Can.
Davol Rubber Co., Providence, R. I.
Buss Rubber Co., Trenton, N. J.
Faultless Rubber Co., Ashland, Ohio.
Goodyear Rubber Co., New York.
New York Rubber Co., New York.
Seamless Rubber Co., Inc., The, New Haven, Conn.
United States Rubber Co., New York.

Bathing Caps.

Ousefield Rubber Co., Bridgeport, Conn.
Davol Rubber Co., Providence, R. I.
Faultless Rubber Co., Ashland, Ohio.
Hodgman Rubber Co., New York.
North British Rubber Co., Ltd., Edinburgh, Scotland.
Seamless Rubber Co., Inc., New Haven, Conn.
Siola Rubber Mfg. Co., Inc., The, New York.
Tyer Rubber Co., Andover, Mass.
United States Rubber Co., New York.

Bulbs.

Faultless Rubber Co., Ashland, Ohio.
Goodyear Rubber Co., New York.
Seamless Rubber Co., Inc., New Haven, Conn.
Siola Rubber Mfg. Co., Inc., The, New York.
Tyer Rubber Co., Andover, Mass.
United States Rubber Co., New York.
Whitall Tatum Co., New York.

Combination Fountain Syringe and Hot Water Bottle Fixtures.

Brass Goods Mfg. Co., Brooklyn, N. Y.
Schrader's, A., Son, Inc., New York.

Combs.

American Hard Rubber Co., New York.
Goodyear Rubber Co., New York.
North British Rubber Co., Ltd., Edinburgh, Scotland.
Seamless Rubber Co., Inc., The, New Haven, Conn.
Vulcanized Rubber Co., New York.

Elastic Bands.

Davol Rubber Co., Providence, R. I.
Easthampton Rubber Thread Co., Easthampton, Mass.
Goodyear Rubber Co., New York.
Hodgman Rubber Co., New York.
Seamless Rubber Co., Inc., New Haven, Conn.
Siola Rubber Mfg. Co., Inc., The, New York.

Electricians' and Surgeons' Gloves.

Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Davol Rubber Co., Providence, R. I.
Faultless Rubber Co., Ashland, Ohio.
Goodyear Rubber Co., New York.
Hodgman Rubber Co., New York.
North British Rubber Co., Ltd., Edinburgh, Scotland.
Rubber Products Co., Barberton, O.
Seamless Rubber Co., Inc., New Haven, Conn.
United States Rubber Co., New York.

Erasive Rubbers.

Buckeye Rubber Products Co., The, Willoughby, Ohio.
Faultless Rubber Co., Ashland, Ohio.
North British Rubber Co., Ltd., Edinburgh, Scotland.

Finger Cots.

Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Davol Rubber Co., Providence.

Finger Cots—Continued

Faultless Rubber Co., Ashland, Ohio.
Goodyear Rubber Co., New York.
Rubber Products Co., The, Barberton, O.
Seamless Rubber Co., Inc., New Haven, Conn.
United States Rubber Co., New York.
Whitall Tatum Co., N. Y.

Fountain Syringes

Davidson Rubber Co., Boston, Mass.
Goodyear Rubber Co., New York.
Seamless Rubber Co., Inc., The, New Haven, Conn.
Tyer Rubber Co., Andover, Mass.
United States Rubber Co., New York.

Hard Rubber Goods.

American Hard Rubber Co., New York.
Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Davidson Rubber Co., Boston, Mass.
Davol Rubber Co., Providence, R. I.
Goodyear Rubber Co., New York.
North British Rubber Co., Ltd., Edinburgh, Scotland.
Seamless Rubber Co., Inc., New Haven, Conn.
Stokes, Joseph, Rubber Co., Trenton, N. J.
Tyer Rubber Co., Andover, Mass.
United States Rubber Co., New York.
Vulcanized Rubber Co., New York.

Hospital Sheetings.

Archer Rubber Co., Milford, Mass.
Boston Woven Hose & Rubber Co., Cambridge, Mass.
Cambridge Rubber Co., Cambridge, Mass.
Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Eureka Rubber Mfg. Co., Long Island City, N. Y.
Goodyear Rubber Co., New York.
Hale, Alfred, Rubber Co., Atlantic, Mass.
Hodgman Rubber Co., New York.
Meade Rubber Co., Stoughton, Mass.
North British Rubber Co., Ltd., Edinburgh, Scotland.

Hospital Sheetings—Continued

Seamless Rubber Co., Inc., The, New Haven, Conn.
Siola Rubber Mfg. Co., Inc., The, New York.
Tyer Rubber Co., Andover, Mass.
United States Rubber Co., New York.
Vulcan Proofing Co., Brooklyn, N. Y.

Hot Water Bottle Stoppies.

Schrader's, A., Sons, Inc., New York.

Hot Water Bottles, Throat Bags, Ice Bags and Ice Bag Caps.

Brass Goods Mfg. Co., Brooklyn, N. Y.
Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Davidson Rubber Co., Boston, Mass.
Davol Rubber Co., Providence, R. I.
Faultless Rubber Co., Ashland, Ohio.
Goodyear Rubber Co., New York.
Hodgman Rubber Co., New York.
North British Rubber Co., Ltd., Edinburgh, Scotland.
Rubber Products Co., The, Barberton, O.
Schrader's, A., Son, Inc., Brooklyn, N. Y.
Seamless Rubber Co., Inc., New Haven, Conn.
Tyer Rubber Co., Andover, Mass.
United States Rubber Co., New York.
Whitall Tatum Co., N. Y.

Life Preservers.

Davol Rubber Co., Providence, R. I.
Hodgman Rubber Co., New York.
North British Rubber Co., Ltd., Edinburgh, Scotland.
United States Rubber Co., New York.

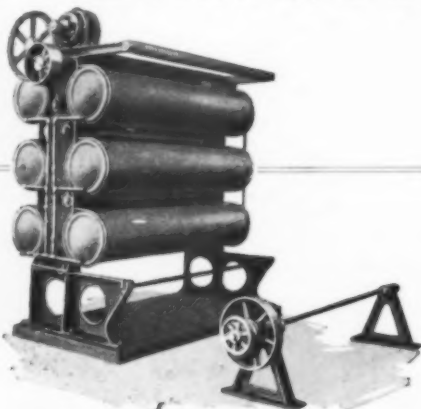
Nipples.

Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Davidson Rubber Co., Boston, Mass.
Davol Rubber Co., Providence, R. I.
Faultless Rubber Co., Ashland, Ohio.
Goodyear Rubber Co., New York.
North British Rubber Co., Ltd., Edinburgh, Scotland.

For Complete Addresses See Advertisements—Index Page 73

The Banner Machine Co.

COLUMBIANA, OHIO



TIRE FABRIC DRYER

Molds and Cores, Tube Removing Machines, Roller Bearing Tire Stands, Cord Fabric Impregnators, Banner Tire Building Machines, Experimental Mills and Washers.

Complete Line of Hose Making Machinery.

ALL KINDS OF TIRE SHOP EQUIPMENT

RAINCOATS, BLANKETS, PONCHOS, etc.

The Quality Which Gives
Service Under All Conditions.

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65 Brookside Ave., Boston 30, Mass.

EMBOSSING CALENDERS

For Artificial Leather, Oil Cloth,
Carriage and Automobile Covers

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with Copper or tinned iron Cylinders for Cotton Ducks
Drills and Sheetings

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PROVIDENCE, R. I.

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Look for the seal



None genuine without it

Crown Chemical Works
Mitcham Common, England

SINCE 1883

Look for the seal



None genuine without it

GOLDEN and CRIMSON ANTIMONIES

Standards unexcelled for uniformity, also

Pure Pentasulphide of Antimony

Entirely free of Calcium Sulphate, with any percentage of Free Sulphur required

ABSOLUTELY NOTHING FINER PRODUCED

INDIA RUBBER YELLOWS AND GREEN

Arsenic Sulphide, Cadmium Sulphide, Chromium Oxide—for Hot or Cold Cure

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of the better kind for discriminating buyers

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Bank of Hamilton Buildings, Toronto

Stocks held in Montreal and Toronto.

R. S. HARDY CO.

Crude Rubber

Broker

66 Broad Street, New York

Telephones, Broad 0867, 0868, 0869, 0870

MID EAST TRADING COMPANY

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Crude Rubber and Produce Merchants

We are experts on these products, and guarantee to give entire satisfaction on every shipment.

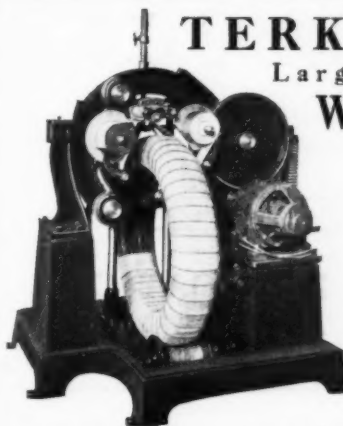
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Codes Used: Western Union and Bentley's.

TERKELSEN

Large Wire-Coil

Wrapping Unit



WRAPS WITH
PAPER, BURLAP,
OR BOTH. FAST,
DEPENDABLE

WRAPS TIGHT-
LY. UNIFORM
HEM.

ECONOMICAL

PATENTED

All Terkelsen Units Sold Outright

We also build the

Terkelsen small wire-coil wrapping unit

(Takes minimum eye of 4")

Terkelsen medium wire-coil wrapping unit

Terkelsen single-tire wrapping unit

Terkelsen tire-bundling machine

(50 bundles hourly—100 to 300 tires hourly ready for marking and shipping)

Terkelsen hose wrapper for 50-foot lengths

Terkelsen hose bundling machine

Largest and most complete line of wrapping machinery in the world

TERKELSEN MACHINE COMPANY

TERKELSEN BUILDING

BOSTON, U. S. A.

RUBBER BUYERS' DIRECTORY—Continued.

Nipples—Continued.

Seamless Rubber Co., Inc., New Haven, Conn.
 Tyler Rubber Co., Andover, Mass.
 United States Rubber Co., New York.
 Whitall Tatum Co., N. Y.

Shower Bath Sprinklers.

Brass Goods Mfg. Co., Brooklyn, N. Y.
 Davol Rubber Co., Providence.
 Hodgman Rubber Co., New York.
 Schrader's, A. Son, Inc., New York.
 Seamless Rubber Co., Inc., New Haven, Conn.
 Siola Rubber Mfg. Co., Inc., The, New York.
 United States Rubber Co., New York.

Sponges.

Paulitson Rubber Co., Ashland, Ohio.
 United States Rubber Co., New York.

Stationers' Sundries.

American Hard Rubber Co., New York.
 Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
 Cincinnati Rubber Mfg. Co., Cincinnati, Ohio.
 Davol Rubber Co., Providence, R. I.
 Goodyear Rubber Co., New York.
 Hodgman Rubber Co., New York.
 Seamless Rubber Co., Inc., New Haven, Conn.
 Siola Rubber Mfg. Co., Inc., The, New York.
 Tyler Rubber Co., Andover, Mass.
 United States Rubber Co., New York.

Stopples (Metal).

Brass Goods Mfg. Co., Brooklyn, N. Y.
 Schrader's, A. Son, Inc., New York.

Stopples (Rubber).

Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
 Canfield Rubber Co., Bridgeport, Conn.
 Davol Rubber Co., Boston.
 Davol Rubber Co., Providence, R. I.
 Goodyear Rubber Co., New York.
 Hodgman Rubber Co., New York.
 New York Belting & Packing Co., N. Y.
 Seamless Rubber Co., Inc., New Haven, Conn.

Stopples (Rubber)—Continued.

Siola Rubber Mfg. Co., Inc., The, New York.
 United States Rubber Co., New York.

Thread.

Easthampton Rubber Thread Co., Easthampton, Mass.
 Goodyear Rubber Co., New York.
 Mechanical Fabric Co., Providence, R. I.
 United States Rubber Co., New York.

Tobacco Pouches.

Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
 Davol Rubber Co., Providence, R. I.
 North British Rubber Co., Ltd., Edinburgh, Scotland.
 Rubber Products Co., The, Barberton, O.
 Seamless Rubber Co., Inc., New Haven, Conn.
 Siola Rubber Mfg. Co., Inc., The, New York.
 Tyler Rubber Co., Andover, Mass.
 United States Rubber Co., New York.

MACKINTOSHED AND SURFACE GOODS.**Airplane and Balloon Cloths.**

North British Rubber Co., Ltd., Edinburgh, Scotland.
 United States Rubber Co., New York.

Air Mattresses.

Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
 Davol Rubber Co., Providence, R. I.
 Hodgman Rubber Co., New York.
 North British Rubber Co., Ltd., Edinburgh, Scotland.
 Siola Rubber Mfg. Co., Inc., The, New York.
 United States Rubber Co., New York.

Aprons—Rubber.

Archer Rubber Co., Milford, Mass.
 Cambridge Rubber Co., Cambridge, Mass.
 Goodyear Rubber Co., New York.
 Hodgman Rubber Co., New York.
 Schwarzwaeider Co., The, Philadelphia, Pa.
 Seamless Rubber Co., New Haven, Conn.
 Siola Rubber Mfg. Co., Inc., The, N. Y.
 United States Rubber Co., New York.

Barbers' Bibs.

Canfield Rubber Co., Bridgeport, Conn.
 Davol Rubber Co., Providence, R. I.
 Seamless Rubber Co., Inc., New Haven, Conn.
 Siola Rubber Mfg. Co., Inc., The, New York.
 Tyler Rubber Co., Andover, Mass.
 United States Rubber Co., New York.

Bellows Cloths.

Archer Rubber Co., Milford, Mass.
 Boston Belting Co., Boston, Mass.
 Boston Woven Hose & Rubber Co., Cambridge, Mass.
 Cambridge Rubber Co., Cambridge, Mass.
 Clifton Manufacturing Co., Boston, Mass.
 Hodgman Rubber Co., New York.
 United States Rubber Co., New York.

Blankets—Camp and Hospital.

Archer Rubber Co., Milford, Mass.
 Boston Belting Co., Boston, Mass.
 Boston Woven Hose & Rubber Co., Cambridge, Mass.
 Cambridge Rubber Co., Cambridge, Mass.
 Clifton Manufacturing Co., Boston, Mass.
 Goodyear Rubber Co., New York.
 United States Rubber Co., New York.

Calendering.

Archer Rubber Co., Milford, Mass.
 Buckeye Rubber Products Co., The, Willoughby, Ohio.
 Cambridge Rubber Co., Cambridge, Mass.
 Canfield Rubber Co., Bridgeport, Conn.
 Eureka Rubber Mfg. Co., Long Island City, N. Y.
 Hodgman Rubber Co., New York.
 United States Rubber Co., New York.

Carriage Ducks and Drills.

Acme Rubber Mfg. Co., Trenton, N. J.
 Boston Woven Hose & Rubber Co., Cambridge, Mass.
 Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
 Clifton Manufacturing Co., Boston, Mass.
 Hodgman Rubber Co., New York.
 North British Rubber Co., Ltd., Edinburgh, Scotland.
 United States Rubber Co., New York.

Clothing and Mackintoshes.

Archer Rubber Co., Milford, Mass.
 Badger Raincoat Co., Port Washington, Wis.
 Cambridge Rubber Co., Cambridge, Mass.
 Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
 Clifton Mfg. Co., Boston, Mass.
 Firestone-Apsley Rubber Co., Hudson, Mass.
 Goodyear Rubber Co., New York.
 Hodgman Rubber Co., New York.
 Miner Rubber Co., Ltd., The, Granby, Quebec.
 North British Rubber Co., Edinburgh, Scotland.
 Pirelli, Milan, Italy.
 United States Rubber Co., New York.

Dress Shield Material.

Archer Rubber Co., Milford, Mass.
 Cambridge Rubber Co., Cambridge, Mass.
 Hodgman Rubber Co., New York.
 Schwarzwaeider Co., The, Philadelphia, Pa.
 Siola Rubber Mfg. Co., Inc., The, New York.
 United States Rubber Co., New York.
 Vulcan Proofing Co., Brooklyn, N. Y.

Diving Apparatus.

Hale, Alfred, Rubber Co., Boston, Mass.
 Hodgman Rubber Co., New York.
 Schrader's, A. Son, Inc., Brooklyn.
 United States Rubber Co., New York.

Horse Covers.

Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.

For Complete Addresses See Advertisements—Index Page 75

WATERPROOF COATS

*A Quality-Made Raincoat
for Wholesale Distribution*

Write for Attractive Proposition

BADGER RAINCOAT CO.

Port Washington, Wis.

Would you like to buy a tire Factory?

WE HAVE SEVERAL

Would you like to lease a tire factory?

WE HAVE SEVERAL

The Akron Engineering Co.

Rubber and Power Plant

ENGINEERS

AKRON

46 S. Broadway OHIO

ARCHER RUBBER CO.
MANUFACTURERS OF QUALITY LINES

**Rubber Surface Clothing
Hospital and Nursery Sheetings
Aprons, Blankets and Ponchos
Rubber Fabrics
and Rubberizing**

MAIN OFFICE and FACTORY, MILFORD, MASS.

The Carter Bell Mfg Co.

Highest Grade
**RUBBER
SUBSTITUTES**
White, Brown & Black

150 Nassau Street New York

CORD FABRICS

EXCLUSIVELY

Worcester Tire Fabric Co.

624 Sec. National Bldg.
Akron, Ohio

Worcester, Mass.

PIRELLI

MILAN, ITALY

ELECTRICAL CABLES & WIRES
INSULATING MATERIAL AND
ACCESSORIES
PNEUMATIC AND SOLID TYRES,
ACCESSORIES
ALL CLASSES OF INDIA-RUBBER,
EBONITE, PROOFED CLOTH, Etc.
(Technical, Surgical and Sundry)

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IN ITALY: Ancona, Bari, Bologna, Bolzano, Cagliari,
Catania, Florence, Genoa, Milan, Naples,
Palermo, Padua, Rome, Turin, Trento,
Trieste.

ABROAD: London (Bristol, Manchester, Glasgow),
Barcelona (Bilbao, Siviglia, La Coruna,
Madrid), Bruxelles, Bucarest, Buenos Ayres,
Mendoza and Montevideo), Paris, Zurich.

WORKS—In Italy, England, Spain, Argentine.

RUBBER PLANTATIONS—near Singapore and in the
Isle of Java.

Manufacturers of

MOLDS for Mechanical Rubber Goods



MOLDS FOR

Heels, Soles, Hot Water Bottles, Syringe Bags, Bulbs,
Battery Jars and Covers, Hard Rubber Pipes, etc.

Specialists in the manufacture of STEEL molds.

ALSO

Die Sinkers and Engravers. Medallion Dies a Specialty.

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Corner Crosier & High Sts., Akron, O.

William H. Stiles & Co.

1 LIBERTY ST., NEW YORK

IMPORTERS and MERCHANTS

CRUDE RUBBER

RUBBER BUYERS' DIRECTORY—Continued.

Horse Covers—Continued.

North British Rubber Co., Ltd., Edinburgh, Scotland.

Horse Cover Material.

United States Rubber Co., New York.

Leggings.

North British Rubber Co., Ltd., Edinburgh, Scotland.

Leather, Artificial.

Boston Woven Hose & Rubber Co., Cambridge, Mass.

Piano Player Cloths.

Hodgman Rubber Co., New York.
United States Rubber Co., New York.
Vulcan Proofing Co., Brooklyn, N. Y.

Ponchos.

Archer Rubber Co., Milford, Mass.
Cambridge Rubber Co., Cambridge, Mass.
Clifton Manufacturing Co., Boston, Mass.
Hodgman Rubber Co., New York.
North British Rubber Co., Ltd., Edinburgh, Scotland.
Schwarzwaelder Co., The, Philadelphia, Pa.
United States Rubber Co., New York.

Printing on Rubber Surface.

Archer Rubber Co., Milford, Mass.

Proofing.

Archer Rubber Co., Milford, Mass.
Archer-Strauss Rubber Co., Framingham, Mass.
Cambridge Rubber Co., Cambridge, Mass.
Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Canfield Rubber Co., Bridgeport, Conn.
Eureka Rubber Mfg. Co., Long Island City, N. Y.
Hale, Alfred, Rubber Co., Atlantic, Mass.
Hodgman Rubber Co., New York.
Miner Rubber Co., Ltd., The, Granby, Quebec.
Schwarzwaelder Co., The, Philadelphia, Pa.
Siola Rubber Mfg. Co., Inc., The, New York.

Proofing—Continued.

Vulcan Proofing Co., Brooklyn, N. Y.
United States Rubber Co., New York.

Rubber Coated Cloths.

Archer Rubber Co., Milford, Mass.
Archer-Strauss Rubber Co., Framingham, Mass.
Boston Woven Hose & Rubber Co., Cambridge, Mass.
Cambridge Rubber Co., Cambridge, Mass.
Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Clifton Manufacturing Co., Boston, Mass.
Hale, Alfred, Rubber Co., Atlantic, Mass.
Hodgman Rubber Co., New York.
Mechanical Fabric Co., Providence, R. I.
North British Rubber Co., Ltd., Edinburgh, Scotland.
Schwarzwaelder Co., The, Philadelphia, Pa.
United States Rubber Co., New York.

Spreading—Cord Fabric.

Vulcan Proofing Co., Brooklyn, N. Y.

RUBBER FOOTWEAR.**Boots and Shoes.**

Cambridge Rubber Co., Cambridge, Mass.
Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Firestone-Apsley Rubber Co., Hudson, Mass.
Goodread Rubber Co., New York.
Gutta Percha & Rubber, Limited, Toronto, Canada.
Miner Rubber Co., Granby, Quebec.
North British Rubber Co., Ltd., Edinburgh, Scotland.
United States Rubber Co., New York.

Heels.

Buckeye Rubber Products Co., The, Willoughby, Ohio.
Meade Rubber Co., Stoughton, Mass.
Miner Rubber Co., Ltd., The, Granby, Quebec.

Heels and Soles.

Boston Woven Hose & Rubber Co., Cambridge, Mass.
Cambridge Rubber Co., Cambridge, Mass.
Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Canfield Rubber Co., Bridgeport, Conn.
Essex Rubber Co., Trenton, N. J.
Foster Rubber Co., Boston, Mass.
Gutta Percha and Rubber, Limited, Toronto, Canada.
Hale, Alfred, Rubber Co., Atlantic, Mass.
North British Rubber Co., Ltd., Edinburgh, Scotland.
Siola Rubber Mfg. Co., Inc., The, New York.
United States Rubber Co., New York.
Western Rubber Co., Goshen, Ind.

Heel Burra.

Independent Nail & Packing Co., Bridgewater, Mass.
Sessions, J. H., & Son, Bristol, Conn.
Ward & Andre, Brockton, Mass.

Heel Nails.

Independent Nail & Packing Co., Bridgewater, Mass.
United Shoe Machinery Corporation, Boston, Mass.

Shoe Findings and Specialties.

Clifton Manufacturing Co., Boston, Mass.
Essex Rubber Co., Trenton, N. J.
Foster Rubber Co., The, Boston, Mass.
Meade Rubber Co., Stoughton, Mass.
Siola Rubber Mfg. Co., Inc., The, New York.
United States Knitting Co., Pawtucket, Mass.
United States Rubber Co., New York.

Soling.

Boston Belting Co., Boston, Mass.
Buckeye Rubber Products Co., The, Willoughby, Ohio.
Cambridge Rubber Co., Cambridge, Mass.
Gutta Percha & Rubber, Ltd., Toronto, Can.
Siola Rubber Mfg. Co., Inc., The, New York.

Wading Pants.

Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Hale, Alfred, Rubber Co., Boston, Mass.
North British Rubber Co., Ltd., Edinburgh, Scotland.
United States Rubber Co., New York.

DENTAL AND STAMP RUBBER.**Dental Gum.**

North British Rubber Co., Ltd., Edinburgh, Scotland.
Siola Rubber Mfg. Co., Inc., The, New York.
United States Rubber Co., New York.

Dentists' Sundries.

Siola Rubber Mfg. Co., Inc., The, New York.
United States Rubber Co., New York.

Rubber Dam.

Davol Rubber Co., Providence, R. I.
Hodgman Rubber Co., New York.
Siola Rubber Mfg. Co., Inc., The, New York.
United States Rubber Co., New York.

Sponge Rubber.

Faultless Rubber Co., Ashland, Ohio.
United States Rubber Co., New York.

Stamp Gum.

Gutta Percha & Rubber, Ltd., Toronto.
Siola Rubber Mfg. Co., Inc., The, New York.
United States Rubber Co., New York.

ELECTRICAL.**Electrical Supplies.**

American Hard Rubber Co., New York.
Canfield Rubber Co., Bridgeport, Conn.
Siola Rubber Mfg. Co., Inc., The, New York.
Stokes, Joseph, Rubber Co., Trenton, N. J.
Tyler Rubber Co., Andover, Mass.

For Complete Addresses See Advertisements—Index Page 73

CAMCO

CAMBRIDGE RUBBER CO.
PRODUCTS OF QUALITY

RUBBER FOOTWEAR
CANVAS FOOTWEAR
OUTING SHOES
HEELS AND SOLES
MOLDED GOODS
RUBBER CLOTHING
MACKINTOSHES
CALENDERING
PROOFING

CAMBRIDGE RUBBER CO.
CAMBRIDGE MASS U S A

MAHLOW & WYCKOFF, Trenton, N.J.

MACHINISTS AND TOOLMAKERS

Hard Rubber and Soft Rubber Molds
Special Machinery. Machinery Built to Order

If you have operations which you now do by hand and wish to do the same by machine, we would be pleased to have you take the matter up with us.

LOTHAR E. WEBER, Ph. D.

Analytical and Consulting Rubber Chemist
729 Boylston St., Boston

BERGENPORT BRAND

PURE SOFT SULPHUR

PREPARED ESPECIALLY FOR

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T. & S. C. WHITE CO.

Established 1841

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NEW YORK



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THE USMC Eyeletting Machine—Model B—is a small, easy running machine used for inserting eyelets in all kinds of rubber goods. The eyelets feed automatically.

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Brockton, Mass.....93 Centre
Cincinnati.....708 Broadway
Chicago.....18 South Market
Haverhill, Mass.....145 Essex
Johnson City, N. Y., 124 Main
Lynn, Mass.....306 Broad

United Shoe Machinery Corporation
BOSTON, MASSACHUSETTS

Branches

Marlboro, Mass.....11 Florence
Milwaukee.....258 Fourth
New Orleans.....216 Chartres
New York.....37 Warren
Philadelphia.....221 North 13th
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PITTSBURGH, PA.

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Electrical Supplies—Continued.

United States Rubber Co., New York.
Vulcanised Rubber Co., New York.

Hard Rubber Goods.

American Hard Rubber Co., New York.
Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Canfield Rubber Co., Bridgeport, Conn.
Goodyear Rubber Co., New York.
North British Rubber Co., Ltd., Edinburgh, Scotland.
Stokes, Joseph, Rubber Co., Trenton, N. J.
United States Rubber Co., New York.
Vulcanised Rubber Co., New York.
Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

Insulating Compounds.

Buckeye Rubber Products Co., The, Willoughby, Ohio.
Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Canfield Rubber Co., Bridgeport, Conn.
Gutta Percha and Rubber, Limited, Toronto, Canada.
Siola Rubber Mfg. Co., Inc., The, New York.
Tidewater Chemical Co., Inc., New York.
Tyson Bros., Inc., Woodbridge, N. J.

Insulated Wire and Cables.

Indiana Rubber and Insulated Wire Co., Jonesboro, Ind.
Kerite Ins. Wire & Cable Co., N. Y.
Pirelli, Milan, Italy.
United States Rubber Co., New York.
Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

Splicing Compounds.

Boston Woven Hose & Rubber Co., Cambridge, Mass.
Buckeye Rubber Products Co., The, Willoughby, Ohio.
Canfield Rubber Co., Bridgeport, Conn.
Clifton Manufacturing Co., Boston, Mass.
Home Rubber Co., Trenton, N. J.
Siola Rubber Mfg. Co., Inc., The, New York.
United States Rubber Co., New York.

Tape—Rubber Insulating.

Buckeye Rubber Products Co., The, Willoughby, Ohio.
Clifton Manufacturing Co., Boston, Mass.
North British Rubber Co., Ltd., Edinburgh, Scotland.
Siola Rubber Mfg. Co., Inc., The, New York.
United States Rubber Co., New York.

Tape—Cloth Friction.

Boston Woven Hose & Rubber Co., Cambridge, Mass.
Buckeye Rubber Products Co., The, Willoughby, Ohio.
Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Canfield Rubber Co., Bridgeport, Conn.
Clifton Manufacturing Co., Boston, Mass.
Home Rubber Co., Trenton, N. J.
North British Rubber Co., Ltd., Edinburgh, Scotland.
Siola Rubber Mfg. Co., Inc., The, New York.
United States Rubber Co., New York.

Wire—Rubber Insulated.

United States Rubber Co., New York.

Wire—Lead Covered.

United States Rubber Co., New York.

SPORTING GOODS.**Foot Balls.**

Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Seamless Rubber Co., Inc., The, New Haven, Conn.
Tyer Rubber Co., Andover, Mass.
United States Rubber Co., New York.

Golf Balls.

North British Rubber Co., Ltd., Edinburgh, Scotland.
United States Rubber Co., New York.

Sporting Goods.

Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.

Sporting Goods—Continued.

Essex Rubber Co., Trenton, N. J.
Hodgman Rubber Co., New York.
North British Rubber Co., Ltd., Edinburgh, Scotland.
Pennsylvania Rubber Co., Jeannette, Pa.
Seamless Rubber Co., Inc., New Haven, Conn.
Tyer Rubber Co., Andover, Mass.
United States Rubber Co., New York.

Striking Bags.

Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Rubber Products Co., Barberton, O.
Seamless Rubber Co., Inc., New Haven, Conn.
Tyer Rubber Co., Andover, Mass.
United States Rubber Co., New York.

Tennis Balls.

Pennsylvania Rubber Co., Jeannette, Pa.

RUBBER TIRES AND ACCESSORIES.**Accessories.**

Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Essex Rubber Co., Trenton, N. J.
Firestone Tire & Rubber Co., Akron, O.
Fisk Rubber Co., Chillicothe Falls, Mass.
General Tire & Rubber Co., Akron, Ohio.
Gutta Percha & Rubber, Ltd., Toronto, Canada.
Siola Rubber Mfg. Co., Inc., The, New York.
United States Rubber Co., New York.
Voorhees Rubber Mfg. Co., Jersey City, N. J.

Auto Top Fabrics.

Boston Woven Hose & Rubber Co., Cambridge, Mass.

Auto Top Fabrics—Continued.

Cambridge Rubber Co., Cambridge, Mass.
Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Indiana Rubber & Insulated Wire Co., Jonesboro, Ind.
Lawrence & Co., New York.
North British Rubber Co., Ltd., Edinburgh, Scotland.
Siola Rubber Mfg. Co., Inc., The, N. Y.
Taylor, Armitage & Eagles, Inc., N. Y.
United States Rubber Co., New York.
Vulcan Proofing Co., Brooklyn, N. Y.

Bead Braid (Wire).

National-Standard Co., Niles, Mich.

Inner Tubes.

Acme Rubber Mfg. Co., Trenton, N. J.
Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Essex Rubber Co., Trenton, N. J.
Firestone Tire & Rubber Co., Akron, O.
Fisk Rubber Co., The, Chillicothe Falls, Mass.
General Tire & Rubber Co., Akron, Ohio.
Gutta Percha & Rubber, Ltd., Toronto.
Hewitt Rubber Co., Buffalo, N. Y.
McGraw Tire & Rubber Co., The, East Palestine, Ohio.
North British Rubber Co., Ltd., Edinburgh, Scotland.
Pennsylvania Rubber Co., Jeannette, Pa.
Quaker City Rubber Co., Philadelphia, Pa.
Rubber Products Co., Barberton, O.
Tyer Rubber Co., Andover, Mass.
United States Rubber Co., New York.
Voorhees Rubber Mfg. Co., Jersey City, N. J.

Mats—Automobile.

(See Matting and Mechanical Rubber Goods.)

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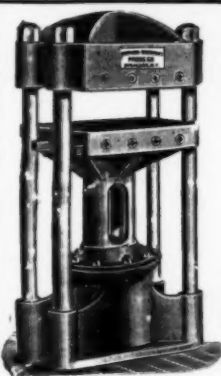
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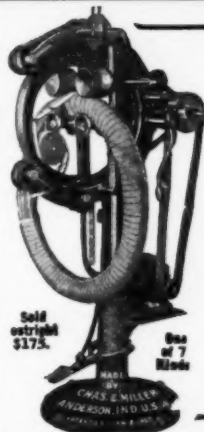
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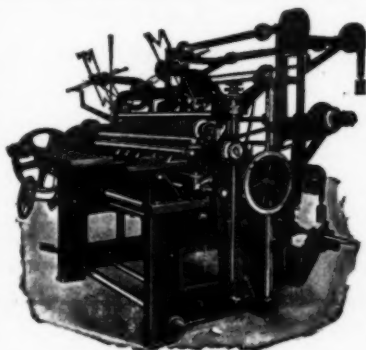
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 Essex Rubber Co., Trenton, N. J.
 Flak Rubber Co., New York.
 General Tire & Rubber Co., Akron, Ohio.
 Miller, Chas. E., Anderson, Ind.
 Mohr Rubber Mfg. Co., Inc., The, New York.
 United States Rubber Co., New York.

Tires (Airplanes).

North British Rubber Co., Ltd., Edinburgh, Scotland.

Tires (Auto).

Adams Rubber Mfg. Co., Trenton, N. J.
 Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
 Culp, George K., Inc., New York.
 Firestone Tire & Rubber Co., Akron, Ohio.
 Flak Rubber Co., Chicopee Falls, Mass.
 General Tire & Rubber Co., Akron, Ohio.
 Gutta Percha & Rubber, Ltd., Toronto.
 Hewitt Rubber Co., Buffalo, N. Y.
 McGraw Tire & Rubber Co., The, East Palestine, Ohio.
 Miller, Chas. E., Anderson, Ind.
 North British Rubber Co., Ltd., Edinburgh, Scotland.
 Pennsylvania Rubber Co., Jeannette, Pa.
 Pirelli, Milan, Italy.

Tires (Auto)—Continued.

Quaker City Rubber Co., Philadelphia, Pa.
 Rubber Products Co., Barberton, O.
 Thermoid Rubber Co., Trenton, N. J.
 Tyer Rubber Co., Andover, Mass.
 United States Rubber Co., New York.

Tires—Baby Carriage.

Boston Woven Hose & Rubber Co., Cambridge, Mass.
 Cincinnati Rubber Co., Cincinnati, O.
 Firestone Tire & Rubber Co., Akron, O.
 Goodyear Rubber Co., New York.
 Gutta Percha & Rubber, Ltd., Toronto, Canada.
 North British Rubber Co., Ltd., Edinburgh, Scotland.
 Quaker City Rubber Co., Philadelphia, Pa.
 United States Rubber Co., New York.

Tires (Bicycle).

Firestone Tire & Rubber Co., Akron, O.
 Flak Rubber Co., Chicopee Falls, Mass.
 Indiana Rubber & Insulated Wire Co., Jonesboro, Ind.
 Miller, Chas. E., Anderson, Ind.
 North British Rubber Co., Ltd., Edinburgh, Scotland.
 Pennsylvania Rubber Co., Jeannette, Pa.

Tires (Motorcycle).

Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
 Firestone Tire & Rubber Co., Akron, O.
 Flak Rubber Co., Chicopee Falls, Mass.
 Miller, Chas. E., Anderson, Ind.
 North British Rubber Co., Ltd., Edinburgh, Scotland.
 Pennsylvania Rubber Co., Jeannette, Pa.

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Tires (Solid).

Buckeye Rubber Products Co., The, Willoughby, Ohio.
 Canadian Consolidated Rubber Co., Ltd., Montreal, Can.
 Firestone Tire & Rubber Co., Akron, O.
 Flak Rubber Co., Chicopee Falls, Mass.
 Gutta Percha & Rubber, Ltd., Toronto, Canada.
 North British Rubber Co., Ltd., Edinburgh, Scotland.
 United States Rubber Co., New York.

Tire Fabrics (See Cotton Goods in Raw Materials and Supplies).

Tire Repair Materials.

Buckeye Rubber Products Co., The, Willoughby, Ohio.
 Essex Rubber Co., Trenton, N. J.
 Flak Rubber Co., Chicopee Falls, Mass.
 Miller, Chas. E., Anderson, Ind.
 Mohr Rubber Mfg. Co., Inc., The, New York.
 Voorhees Rubber Mfg. Co., Jersey City, N. J.

Valves, Tire.

Schrader's, A. Sons, Inc., New York.

Wire Bead Braids (Flat).

National-Standard Co., Niles, Mich.

RUBBER MACHINERY.

Accumulators—Hydraulic.

Adamson Machine Co., The, Akron, O.
 Akron Equipment Co., The, Akron, O.
 Allen Machine Co., Erie, Pa.
 Birmingham Iron Foundry, Derby, Conn.

Accumulators—Hydraulic. Cont.

Dunning & Bouchert Press Co., Inc., The, Syracuse, N. Y.
 Farrel F. & M. Co., Ansonia, Conn.
 Hydraulic Press Mfg. Co., The, Mt. Gilead, Ohio.
 Southwark Foundry & Machine Co., Philadelphia, Pa.
 Thropp's John E. Sons Co., Trenton, N. J.
 Watson-Stillman Co., The, New York.
 Williams F. & M. Co., Akron, Ohio.

Acid Tanks.

Buffalo Foundry & Machine Co., Buffalo, N. Y.
 Devine, J. P., Co., Buffalo, N. Y.
 Farrel F. & M. Co., Ansonia, Conn.

Air Bags

Miller, Charles E., Anderson, Ind.

Air Compressors.

Miller, Chas. E., Anderson, Ind.
 Williams F. & M. Co., Akron, Ohio.

Band Cutting Machines.

Adamson Machine Co., The, Akron, O.
 Birmingham Iron Foundry, Derby, Conn.

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mechanical, molded and wrapped rubber goods.
We are glad to entertain your inquiries.

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We formulate plans and layouts for complete Rubber Plants, furnish designs, construction and specifications.

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Designed, built, installed and checked.

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Systems installed, departments arranged for the economical handling of materials.

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HIGH QUALITIES
UNIFORM GRADES
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AKRON, OHIO

C. FRANZ, President

J. K. WILLIAMS, Vice-President

C. W. FRANZ, Vice-President and Sales Manager

RUBBER BUYERS' DIRECTORY—Continued.

Bead Presses. Allen Machine Co., Erie, Pa. Farrel Foundry & Machine Co., Ansonia, Conn. Hydraulic Press Mfg. Co., The Mount Gilead, Ohio. Southwark Foundry & Machine Co., Philadelphia, Pa. Williams Foundry & Machine Co., The Akron, Ohio.	Buffing Machines. Banner Machine Co., The, Columbiana, Ohio. Williams Foundry & Machine Co., The, Akron, Ohio. Burrs—Light Steel for Rubber Heels. Independent Nail & Packing Co., Bridge-water, Mass. Sessions, J. H., & Son, Bristol, Conn. Ward & Andre, Brockton, Mass.	Cell Dryers Butterworth, H. W., & Sons Co., Philadelphia, Pa. Chains. Agricultural. Automobile Engine. Bicycle (Twin Roller). Block. Drive. Power Transmission. Silent (Rocker-Joint). Sprocket Wheel. Morse Chain Co., Ithaca, N. Y.	Compound and Tote Boxes. Ornamental Iron Work Co., Akron, Ohio. Condensers. Buffalo Fdy. & Mach. Co., Buffalo, N. Y. Controllers—Electrical. Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.
Bead Trimmers. Banner Machine Co., The, Columbiana, Ohio. Bridgwater Machine Co., The, Akron, Ohio.	Calenders. Adamson Machine Co., The, Akron, Ohio. Allen Machine Co., Erie, Pa. Birmingham Iron Foundry, Derby, Conn. Black Rock Mfg. Co., Bridgeport, Conn. Bridge, David, & Co., Castleton, Manchester, Eng. Farrel F. & M. Co., Ansonia, Conn. Vaughn Machinery Co., The, Cuyahoga Falls, Ohio.	Chemical Apparatus. Devine, J. P., Co., Buffalo, N. Y. Chemical Plants. Buffalo Foundry & Machine Co., Buffalo, N. Y. Devine, J. P., Co., Buffalo, N. Y.	Cooling Tables. Ornamental Iron Work Co., Akron, Ohio. Counters. Schaeffer & Budenberg Mfg. Co., The, Brooklyn, N. Y.
Belt Folding Machines. Birmingham Iron Foundry, Derby, Conn. Farrel F. & M. Co., Ansonia, Conn.	Calenders—Brake Lining. Allen Machine Co., Erie, Pa. Black Rock Mfg. Co., The, Bridgeport, Conn.	Chucks—Lathe and Drill. Hoggson & Pettis Mfg. Co., New Haven, Conn.	Couplings. Allen Machine Co., Erie, Pa. Allis-Chalmers Mfg. Co., Milwaukee, Wis. Birmingham Iron Foundry, Derby, Conn. Dixon Valve & Coupling Co., Philadelphia, Pa.
Belt Slitters. Birmingham Iron Foundry, Derby, Conn. Farrel F. & M. Co., Ansonia, Conn.	Calender Screw-Down—Motor Driven. Allen Machine Co., Erie, Pa. Birmingham Iron Foundry, Derby, Conn. Farrel Foundry & Machine Co., Ansonia, Conn.	Churns and Cement Making Machines. Day Co., J. H., Cincinnati, Ohio. East Iron & Machine Co., Lima, Ohio. Miller, Chas. E., Anderson, Ind.	Couplings—Flexible and Rigid. Allis-Chalmers Mfg. Co., Milwaukee, Wis. Birmingham Iron Foundry, Derby, Conn. Farrel Foundry & Machine Co., Ansonia, Conn. Smith & Serrell, Newark, N. J.
Belt Stretchers. Birmingham Iron Foundry, Derby, Conn. Farrel F. & M. Co., Ansonia, Conn. Hoggson & Pettis Mfg. Co., New Haven, Conn. Southwark Foundry & Machine Co., Philadelphia, Pa.	Casting Models. College Point Rubber Mold & Engraving Co., College Point, L. I., N. Y.	Cloth Dryers. Allen Machine Co., Erie, Pa. Banner Machine Co., The, Columbiana, Ohio. Birmingham Iron Fdy., Derby, Conn. Butterworth, H. W., & Sons Co., Philadelphia, Pa. Farrel F. & M. Co., Ansonia, Conn. Textile-Finishing Machinery Co., Providence, R. I.	Crackers. Adamson Machine Co., The, Akron, Ohio. Allen Machine Co., Erie, Pa. Birmingham Iron Foundry, Derby, Conn. Farrel F. & M. Co., Ansonia, Conn. Vaughn Machinery Co., The, Cuyahoga Falls, Ohio.
Belt Trimmers. Bridgwater Machine Co., The, Akron, Ohio.	Castings. Adamson Machine Co., The, Akron, O. Allen Machine Co., Erie, Pa. Banner Machine Co., The, Columbiana, Ohio. Birmingham Iron Foundry, Derby, Conn. Buffalo Foundry & Machine Co., Buffalo, N. Y. Farrel F. & M. Co., Ansonia, Conn. Vaughn Machinery Co., The, Cuyahoga Falls, Ohio. Williams F. & M. Co., Akron, Ohio.	Clutch Brakes—Pneumatic. Birmingham Iron Foundry, Derby, Conn.	Cranes. Allis-Chalmers Mfg. Co., Milwaukee, Wis. Southwark Foundry & Machine Co., Philadelphia, Pa.
Bias Cutters. Birmingham Iron Foundry, Derby, Conn. Spadone Machine Co., Inc., New York.	Castings. Adamson Machine Co., The, Akron, O. Allen Machine Co., Erie, Pa. Banner Machine Co., The, Columbiana, Ohio. Birmingham Iron Foundry, Derby, Conn. Buffalo Foundry & Machine Co., Buffalo, N. Y. Farrel F. & M. Co., Ansonia, Conn. Vaughn Machinery Co., The, Cuyahoga Falls, Ohio. Williams F. & M. Co., Akron, Ohio.	Clutches—Friction. Allen Machine Co., Erie, Pa. Birmingham Iron Fdy., Derby, Conn. Farrel F. & M. Co., Ansonia, Conn. Johnson, Carlyle, Machine Co., The, Manchester, Conn. Vaughn Machinery Co., The, Cuyahoga Falls, Ohio. Williams F. & M. Co., Akron, Ohio.	Cranes—Hydraulic. Watson-Stillman Co., The, New York.
Boilers. Thropp's, John E., Sons Co., Trenton, N. J. Thropp, William R., Sons' Co., Trenton, N. J.	For Complete Addresses See Advertisements—Index Page 73		
Braiders, Hose. New England Butt Co., Providence, R. I.			
Brushing Machines and Brushes. Curtis & Marble Mach. Co., Worcester, Mass.			

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Manufactured to Buyers' Specification and Standard Grades.

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Specially prepared to meet the requirements of rubber manufacturers

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BOTH ARE UNEXCELLED IN FINENESS AND UNIFORMITY

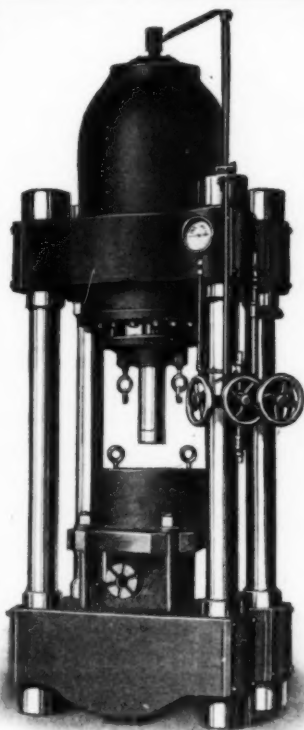
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For Lead Jacket Method of Hose Vulcanizing

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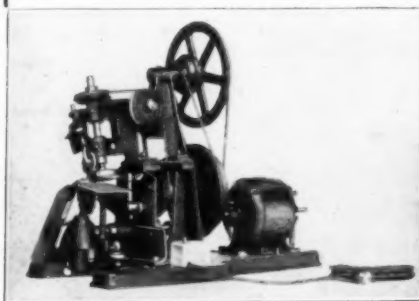
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The Morris Automatic Trimming Machine



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For Heels, Soles, Mechanical Goods, Plumbers' Supplies, Strip Rubber, Valves, Gaskets, Packings, Bead Strips, Fountain Syringes, Water Bottles, Bicycle Tires, etc. Everything in molded goods mostly.

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R. H. FREITAG

The Akron Machine, Mold, Tool & Die Co.

Mechanical Molds, Tools, Dies, Jigs, Fixtures, Templets, Chattering Vices, Tire Molds, Cores, and general machine work.

NO. 696 BLAINE AVE.,

AKRON, OHIO

UNIFORM CURE

assures dependable rubber goods

Rubber products of several kinds are best vulcanized by gradually increasing the temperature, keeping it at maximum for a definite time and then gradually decreasing it.

TRADE MARK
BRISTOL'S
REG. U.S. PAT. OFFICE

Recording Thermometers



on your vulcanizers write a permanent record of every cure, showing what temperature was reached and how long it was maintained. Every chart record may be kept on file as a check on your employees and the serviceability of your goods. Your foreman can quickly detect the negligence of any vulcanizer operator.

Large rubber plants have hundreds of Bristol's recording thermometers in service, proof of

their usefulness, reliability, simplicity and low cost of upkeep.

Write for Catalog W-1202 describing them and other recording instruments widely used by rubber manufacturers everywhere.

THE BRISTOL COMPANY

WATERBURY, CONN.

U. S. A.

RUBBER BUYERS' DIRECTORY—Continued.

Cutters—Crude Rubber.
Peerless Machine Co., Racine, Wis.

Cutters—Scrap.
Taylor, Stiles & Co., Biegelsville, N. J.

Cutters—Tire Section.
Adameon Machine Co., The, Akron, Ohio.
Banner Machine Co., Columbiana, Ohio.

Devulcanizers.
Biggs Boiler Works Co., The, Akron, O.

Die Sinking and Engraving.
College Point Rubber Mold & Engraving Co., College Point, L. I., N. Y.

Die Blocks.
Hogson & Pettis Mfg. Co., The, New Haven, Conn.

Dies.
Akron Equipment Co., The, Akron, O.
Akron Machine, Mold, Tool & Die Co., Akron, Ohio.
Hogson & Pettis Mfg. Co., New Haven, Conn.
Housatonic Mach. & Tool Co., Bridgeport, Conn.
Mechanical Mold & Machine Co., The, Akron, Ohio.
Reynolds Machine Co., The, Massillon, Ohio.
Turkelen Machine Co., Boston, Mass.
Ward & Andre, Brockton, Mass.
Williams F. & M. Co., Akron, Ohio.

Dipped Goods Forms (Porcelain).
Colonial Sign & Insulator Co., Akron, Ohio.
Seville Porcelain Co., Seville, Ohio.
Dipping Machines and Racks.
Ornamental Iron Work Co., Akron, Ohio.

Doubling Machines.
Birmingham Iron Fdry., Derby, Conn.
Farrel F. & M. Co., Ansonia, Conn.

Draft Gages.
Schaeffer & Budenberg Mfg. Co., The, Brooklyn, N. Y.

Drives—Mill.
Allen Machine Co., Erie, Pa.
Birmingham Iron Foundry, Derby, Conn.
Farrell Foundry & Machine Co., Ansonia, Conn.
Fawcus Machine Co., Pittsburgh, Pa.
Vaughn Machinery Co., The, Cuyahoga Falls, Ohio.

Drives—Silent Chain.
Morse Chain Co., Ithaca, N. Y.

Dryers—Vacuum.
Buffalo Fdy. & Mach. Co., Buffalo, N. Y.
Devine, J. P., Co., Buffalo, N. Y.

Drying and Processing.
Carrier Engineering Corp., Newark N. J.
Hunter Dry Kiln Co., Indianapolis, Ind.

Drying Machines.
Allen Machine Co., Erie, Pa.
American Process Co., New York.
Birmingham Iron Foundry, Derby, Conn.
Bridge, David, & Co., Castleton, Manchester, Eng.
Buffalo Foundry & Machine Co., Buffalo, N. Y.
Carrier Engineering Corp., Newark N. J.
Devine, J. P., Co., Buffalo, N. Y.
Farrel F. & M. Co., Ansonia, Conn.
Hunter Dry Kiln Co., Indianapolis, Ind.
Textile-Finishing Machinery Co., Providence, R. I.

Duck Slitters.
Birmingham Iron Foundry, Derby, Conn.

Durometers.
Shore Instrument & Mfg. Co., The, Jamaica, N. Y.

Electrical Safety Switches.
Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

Embossing Calenders.
Allen Machine Co., Erie, Pa.
Birmingham Iron Fdry., Derby, Conn.
Farrel F. & M. Co., Ansonia, Conn.
Textile-Finishing Machinery Co., Providence, R. I.
Vaughn Machinery Co., The, Cuyahoga Falls, Ohio.

Engineering Devices.
Yarnall-Waring Co., Philadelphia, Pa.

Engines—Steam.
Thropp's, John E., Sons Co., Trenton, N. J.
Thropp, William H., Sons' Co., Trenton, N. J.

Engraving Rolls.
Birmingham Iron Fdry., Derby, Conn.
Farrel F. & M. Co., Ansonia, Conn.
Hogson & Pettis Mfg. Co., New Haven, Conn.

Engraving—Tire Molds.
Akron Equipment Co., The, Akron, O.
Allen Machine Co., Erie, Pa.
Banner Machine Co., The, Columbiana, Ohio.
Bridgwater Machine Co., The, Akron, Ohio.
Cladlin Engineering Co., Lancaster, Ohio.
Williams Foundry & Machine Co., The, Akron, Ohio.

Evaporators.
Devine, J. P., Co., Buffalo, N. Y.
Buffalo Foundry & Machine Co., Buffalo, New York.

Eyeletting Machines.
United Shoe Machinery Corporation, Boston, Mass.

Fittings.
Utility Manufacturing Co., Cadaby, Wis.

Fittings—Hydraulic Pipe.
Hydraulic Press Manufacturing Co., The, Mount Gilead, Ohio.
Smith & Serrell, Newark, N. J.
Watson-Stillman Co., The, New York.

Gages.
Bristol Co., The, Waterbury, Conn.
Hogson & Pettis Mfg. Co., New Haven, Conn.
Hydraulic Press Mfg. Co., The, Mount Gilead, Ohio.
Schaeffer & Budenberg Co., The, Brooklyn, N. Y.

Gages—Thickness.
Ames, B. C., & Co.
Hogson & Pettis Mfg. Co., New Haven, Conn.
Randall, Frank E., Waltham, Mass.

Gear Cutting.
Akron Gear & Engineering Co., The, Akron, Ohio.
Birmingham Iron Foundry, Derby, Conn.
Farrel Foundry & Machine Co., Ansonia, Conn.
Fawcus Machine Co., Pittsburgh, Pa.

Gears.
Spring.
Silent Chain.
Compensating.

Akron Gear & Engineering Co., Akron, Ohio.
Allen Machine Co., Erie, Pa.
Farrel Foundry & Machine Co., Ansonia, Conn.
Fawcus Machine Co., Pittsburgh, Pa.
Morse Chain Co., Ithaca, N. Y.

Gears—Helical.
Farrel Foundry & Machine Co., Ansonia, Conn.

Gears—Herringbone.
Birmingham Iron Foundry, Derby, Conn.
Falk Corp., The, Milwaukee, Wis.
Farrel Foundry & Machine Co., Ansonia, Conn.

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Hydraulic Compressed

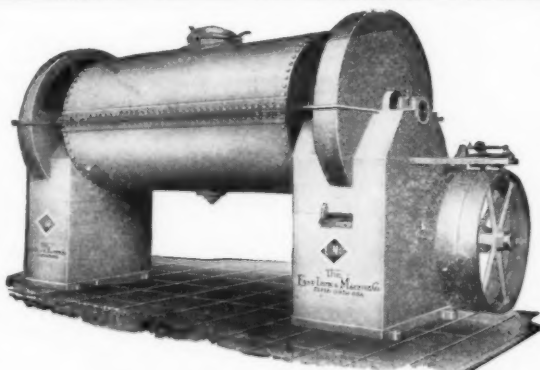


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Factories and Main Office: TRENTON, N. J.

Branches:

New York	Atlanta	Los Angeles	Cleveland
Boston	Detroit	Chicago	Kansas City
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"EIMCO" MIXERS

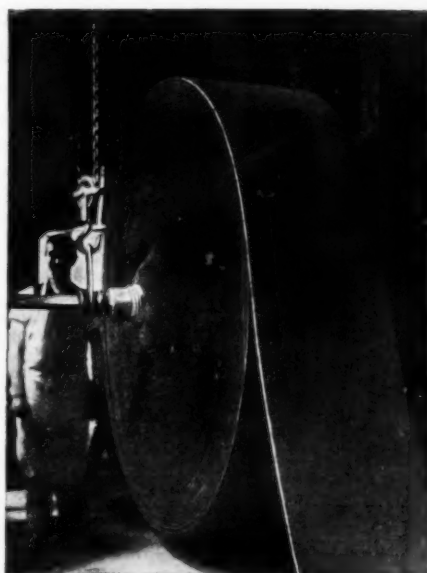
For Rubber Cements and Solutions

Cut the mixing time in half, make smoother cements, and save a lot of solvent. They are wizards for work.

THE "EIMCO" MASTICATOR AND RUBBER COMPOUND MIXER

Is a fully enclosed machine, operated by one man, and mixes batches of 500 lbs. Cuts labor costs, makes uniform mixes, and eliminates dust and fumes.

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LIMA, OHIO



NORTH BRITISH RUBBER BELTING

was first introduced sixty years ago and has a world-wide reputation for high quality and long wearing properties.

NORTH BRITISH CONVEYOR BELTS

are extensively used in Mines in all parts of the World, and some of the largest belts ever made have been supplied by us.

We are also manufacturers of

ROCK DRILL HOSE

High Pressure, Air, Gas, Suction, Steam and Delivery Hose, Valves, Gaskets, Washers, Gauge Glass Rings, Rubber Boots, North British "Clincher" Pneumatic and Solid Rubber Band Tyres for Cycles, Cars and Heavy Vehicles, etc., etc.

Catalogues free on request.

THE NORTH BRITISH RUBBER CO. LTD.
CASTLE MILLS EDINBURGH



Canadian Warehouse

43 Colborne Street, Toronto, Ontario

B1419

RUBBER BUYERS' DIRECTORY—Continued.

Gears—Reduction.

Allen Machine Co., Erie, Pa.
Birmingham Iron Foundry, Derby, Conn.
Cleveland Worm & Gear Co., The Cleveland, Ohio.
Farrel Foundry & Machine Co., Ansonia, Conn.
Fawcett Machine Co., Pittsburgh, Pa.
Vaughn Machinery Co., The Cuyahoga Falls, Ohio.

Gears—Worm

Cleveland Worm & Gear Co., The Cleveland, Ohio.

Grinders—See Mixers.**Hangers.**

Altho-Chalmers Mfg. Co., Milwaukee, Wis.
Birmingham Iron Fdry., Derby, Conn.
Fawcett Machine Co., Pittsburgh, Pa.
Farrel F. & M. Co., Ansonia, Conn.

Heater Presses.

Adamson Machine Co., The Akron, Ohio.
Akron Equipment Co., The Akron, O.
Allen Machine Co., Erie, Pa.
Birmingham Iron Foundry, Derby, Conn.
Hydraulic Press & Mfg. Co., The H. Gilead, Ohio.
Southwick Foundry & Machine Co., Philadelphia, Pa.
Williams Foundry & Machine Co., The Akron, Ohio.

Hoists.

Utility Mfg. Co., Cudahy, Wis.

Hoists—Hydraulic.

Hydraulic Press Mfg. Co., The Mount Gilead, Ohio.
Watson-Stillman Co., The New York.

Hose Machines.

Banner Machine Co., The Columbiana, Ohio.
Birmingham Iron Foundry, Derby, Conn.
Farrel F. & M. Co., Ansonia, Conn.
New England Butt Co., Providence, R. I.
Vaughn Machinery Co., The Cuyahoga Falls, Ohio.

Hose Wiring Machines.

Adamson Machine Co., The Akron, Ohio.
Bridge, David, & Co., Castleton, Manchester, England.

Hydraulic Valves.

Birmingham Iron Foundry, Derby, Conn.
Dunning & Boschert Press Co., Inc., The, Syracuse, N. Y.
Hydraulic Press Mfg. Co., The, Mt. Gilead, Ohio.
Pittsburgh Valve Foundry & Construction Co., Pittsburgh, Pa.
Varnall-Waring Co., Philadelphia, Pa.

Insulating Machinery

Adamson Machine Co., The Akron, O.
Allen Machine Co., Erie, Pa.
Biggs Boiler Works Co., The Akron, Ohio.
Farrel Foundry & Machine Co., Ansonia, Conn.
Housatonic Machine & Tool Co., Bridgeport, Conn.
New England Butt Co., Providence, R. I.
Boyle, John, & Sons, Paterson, N. J.

Jar Ring and Washer Cutting Machines.

Black Rock Mfg. Co., Bridgeport, Conn.

Laboratory Apparatus.

Allen Machine Co., Erie, Pa.
Banner Machine Co., The, Columbiana, Ohio.
Bristol Co., The, Waterbury, Conn.
Schaeffer & Budenberg Co., The, Philadelphia, Pa.

Shore Instrument & Mfg. Co., The, Jamaica, N. Y.

Laboratory Machinery.

Allen Machine Co., Erie, Pa.
Banner Machine Co., The, Columbiana, Ohio.

Biggs Boiler Works Co., The Akron, Ohio.
Birmingham Iron Foundry, Derby, Conn.
Buffalo Foundry & Machine Co., Buffalo, N. Y.

Devine, J. P. Co., Buffalo, N. Y.
Farrel Foundry & Machine Co., Ansonia, Conn.

Shaw, Francis, & Co., Limited, Manchester, England.

Laboratory Machinery—Cont.

Vaughn Machinery Co., The, Cuyahoga Falls, Ohio.

Lathes—Hard Rubber.

Adamson Machine Co., The, Akron, O.

Lathes—Jar Ring.

Adamson Machine Co., The, Akron, O.
Thropp's, John E., Sons Co., Trenton, N. J.
Thropp, William R., Sons' Co., Trenton, N. J.

Locomotive Cranes.

Utility Manufacturing Co., Cudahy, Wis.

Machinery, Transmission**(Power).**

Allen Machine Co., Erie, Pa.
Birmingham Iron Foundry, Derby, Conn.
Farrel Foundry & Machine Co., Ansonia, Conn.
Morse Chain Co., Ithaca, N. Y.
Vaughn Machinery Co., The, Cuyahoga Falls, Ohio.

Machinists' Tools.

Everhard Mfg. Co., The, Canton, Ohio.
Hogson & Pettis Mfg. Co., New Haven, Conn.

Magnetic Clutches and Brakes.

Allen Machine Co., Erie, Pa.
Birmingham Iron Foundry, Derby, Conn.
Farrel Foundry & Machine Co., Ansonia, Conn.

Mandrels—Circular.

Lowe, Clyde E. Co., Cleveland, Ohio.

Mandrels—Tube Splicing.

Williams Foundry & Machine Co., The, Akron, Ohio.

Mandrels—Sherardizing.

Biggs Boiler Works Co., The, Akron, O.
New Haven Sherardizing Co., New Haven, Conn.

Masticators.

Birmingham Iron Foundry, Derby, Conn.
East Iron & Machine Co., The, Lima, Ohio.

Farrel Foundry & Machine Co., Ansonia, Conn.

Measuring Rolls.

Curtis & Marble Mach. Co., Worcester, Mass.

Mill Room Cooling Tables.

Ornamental Iron Work Co., Akron, Ohio.

Mixers.

Adamson Machine Co., The, Akron, Ohio.
Allen Machine Co., Erie, Pa.
Baker, Joseph, Sons & Perkins Co., Inc., White Plains, N. Y.

Biggs Boiler Works Co., The, Akron, Ohio.

Birmingham Iron Foundry, Derby, Conn.
Day, J. H., Co., Cincinnati, Ohio.
East Iron & Machine Co., The, Lima, Ohio.

Farrel Foundry & Machine Co., Ansonia, Conn.

Miller, Chas. E., Anderson, Ind.

Thropp's, John E., Sons Co., Trenton, N. J.

Thropp, William R., Sons' Co., Trenton, N. J.

Vaughn Machinery Co., Cuyahoga Falls, Ohio.

Mixers—Automatic.

Birmingham Iron Foundry, Derby, Conn.
Farrel Foundry & Machine Co., Ansonia, Conn.

Molds.

Adamson Machine Co., The, Akron, O.
Akron Equipment Co., The, Akron, Ohio.
Akron Gear & Engineering Co., Akron, Ohio.

Akron Machine, Mold, Tool & Die Co., Akron, Ohio.

Akron Rubber Mold and Machine Co., Akron, Ohio.

Akron Standard Mold Co., Akron, Ohio.

Banner Machine Co., The, Columbiana, Ohio.

Birmingham Iron Foundry, Derby, Conn.

Bridgewater Machine Co., The, Akron, Ohio.

Brockton Tool Co., Brockton, Mass.
Claffin Engineering Co., Lancaster, Ohio.
De Mattia Bros., Garfield, N. J.

For Complete Addresses See Advertisements—Index Page 73

EXPERIENCE

counts for a great deal when it comes to making molds for HARD RUBBER

Twenty-five years specializing in this class of work fits us particularly well to do the exacting work required for RADIO WORK, and solicit your inquiries along these lines.

COLLEGE POINT MOLD & MACHINE CO.

COLLEGE POINT, N. Y., U. S. A.

Cable Address "COL. MOLDMA," N. Y.



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We have added to our line of Galvanized Tanks, Cement Mixers, Dip Machines, Heating and Ventilating Equipment. Built to your own specifications. Write us for prices.

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RUBBER HEEL BURRS

FLAT and CUPPED

Buy the Burrs with

CENTRAL HOLES

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U. S. A.

Utility Manufacturing Co.

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Tire Painting Machines
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Air Hoists and Air Valves
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Carded and Combed

SELL DIRECT

MOLDS

A General Line of Steel Molds and
Dies for Mechanical and Molded

RUBBER GOODS



We Specialize in

SOLE AND HEEL MOLDS

WE
ALSO MAKE HEEL BURRS

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Peerless High Speed Crude Rubber Slicing Machine

will save 5 to 15 men's time. If your capacity is 500 pounds
or 50,000 pounds per day it will pay you to install the Peerless.

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Peerless Tire Section Cutters Peerless High Speed Hack Saws
Peerless Power and Duplex Hand Blades

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RUBBER BUYERS' DIRECTORY—Continued

Molds—Continued.

Hoggson & Pettis Mfg. Co., New Haven, Conn.
Housatonic Mach. & Tool Co., Bridgeport, Conn.
Kuhke Machine Co., Akron, Ohio.
Mahlow & Wyckoff, Trenton, N. J.
Mechanical Mold & Machine Co., The, Akron, Ohio.
Miller, Chas. E., Anderson, Ind.
Southwark Foundry & Machine Co., Philadelphia, Pa.
Terkelsen Machine Co., Boston, Mass.
Thropp's, John E., Sons Co., Trenton, N. J.
Wade, Levi C., Lynn, Mass.
Ward & Andre, Brockton, Mass.
Williams Foundry & Machine Co., Akron, O.

Molds—Engraving.

Banner Machine Co., The, Columbiana, Ohio.
Clafin Engraving Co., Lancaster, O.
Williams Foundry & Machine Co., The, Akron, Ohio.

Molds—Heels and Soles.

Akron Gear & Engineering Co., Akron, Ohio.
Akron Machine, Mold, Tool & Die Co., Akron, Ohio.
Bridgwater Machine Co., The, Akron, Ohio.
Brockton Tool Co., Brockton, Mass.
College Point Rubber Mold & Engraving Co., College Point, L. I., N. Y.
Hoggson & Pettis Mfg. Co., New Haven, Conn.
Mechanical Mold & Machine Co., Akron, Ohio.
Terkelsen Machine Co., Boston, Mass.
Wade, Levi C., Lynn, Mass.
Ward & Andre, Brockton, Mass.

Molds—Druggists' Sundries.

Akron Machine, Mold, Tool & Die Co., Akron, Ohio.
Bridgwater Machine Co., The, Akron, Ohio.
College Point Rubber Mold & Engraving Co., College Point, L. I., N. Y.

Molds—Druggists' Sundries—Continued.

Hoggson & Pettis Mfg. Co., The, New Haven, Conn.
Mechanical Mold & Machine Co., Akron, Ohio.

Molds—Mechanical Rubber Goods.

Adamson Machine Co., Akron, Ohio.
Akron Gear & Engineering Co., The, Akron, Ohio.
Akron Machine, Mold, Tool & Die Co., Akron, Ohio.
Bridgwater Machine Co., The, Akron, Ohio.
Mechanical Mold & Machine Co., Akron, Ohio.
Terkelsen Machine Co., Boston, Mass.
Wade, Levi C., Lynn, Mass.

Molds and Cores—Tires.

Adamson Machine Co., The, Akron, O.
Akron Equipment Co., Akron, Ohio.
Akron Gear & Engineering Co., Akron, O.
Akron Machine, Mold, Tool & Die Co., Akron, Ohio.
Akron Rubber Mold & Machine Co., Akron, O.
Akron Standard Mold Co., Akron, Ohio.
Allen Machine Co., Erie, Pa.
Banner Machine Co., The, Columbiana, Ohio.
Bridgwater Machine Co., The, Akron, Ohio.
Clafin Engineering Co., Lancaster, Ohio.
College Point Rubber Mold & Engraving Co., College Point, L. I., N. Y.
De Mattia Bros., Garfield, N. J.
Frans Foundry & Machine Co., Akron, Ohio.
Hoggson & Pettis Mfg. Co., The, New Haven, Conn.
Kuhke Machine Co., Akron, Ohio.
Mahlow & Wyckoff, Trenton, N. J.
Miller, Charles E., Anderson, Ind.
Reynolds Machine Co., The, Masillon, Ohio.
Thropp's, John E., Sons Co., Trenton, N. J.
Williams Foundry & Machine Co., Akron, Ohio.

Motors.

Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

Pattern Makers.

Adamson Machine Co., The, Akron, O.
Allen Machine Co., Erie, Pa.
Bridgwater Machine Co., The, Akron, Ohio.
Buffalo Foundry & Machine Co., Buffalo, N. Y.
Vaughn Machinery Co., The, Cuyahoga Falls, Ohio.

Pillow Blocks.

Adamson Machine Co., The, Akron, Ohio.
Allen Machine Co., Erie, Pa.
Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Birmingham Iron Fdry., Derby, Conn.
Farrel F. & M. Co., Ansonia, Conn.
Vaughn Machinery Co., The, Cuyahoga Falls, Ohio.

Plantation Machinery.

Allen Machine Co., Erie, Pa.
Birmingham Iron Foundry, Derby, Conn.
Bridge, David, & Co., Castleton, Eng.
Farrel Foundry & Machine Co., Ansonia, Conn.
Shaw, Francis, & Co., Ltd., Manchester, Eng.

Plantation Supplies.

Bridge, David, & Co., Castleton, Eng.

Presses—Packing.

Black Rock Mfg. Co., The, Bridgeport, Conn.

Presses—Rimming.

Adamson Machine Co., The, Akron, Ohio.
Allen Machine Co., Erie, Pa.
Farrel Foundry & Machine Co., Ansonia, Conn.
Southwark Foundry & Machine Co., Philadelphia, Pa.

Presses—Vulcanizing.

Adamson Machine Co., The, Akron, Ohio.
Akron Equipment Co., The, Akron, O.
Akron Rubber Mold & Machine Co., Akron, Ohio.
Allen Machine Co., Erie, Pa.
Birmingham Iron Foundry, Derby, Conn.

Presses—Vulcanizing—Cont'd.

Bliss, E. W., Co., Brooklyn, N. Y.
Dunning & Boschert Press Co., Inc., Syracuse, N. Y.
Farrel F. & M. Co., Ansonia, Conn.
Hydraulic Press Mfg. Co., The, Mt. Gilead, Ohio.
Southwark Foundry & Machine Co., Philadelphia, Pa.
Thropp's, John E., Sons Co., Trenton, N. J.
Thropp, William R., Sons' Co., Trenton, N. J.
Vaughn Machinery Co., The, Cuyahoga Falls, Ohio.
Watson-Stillman Co., The, New York.
Williams Foundry & Machine Co., Akron, O.

Pumps.

Adamson Machine Co., The, Akron, Ohio.
Allen Machine Co., Erie, Pa.
Birmingham Iron Foundry, Derby, Conn.
Buffalo Foundry & Machine Co., Buffalo, N. Y.
Devine, J. P., Co., Buffalo, N. Y.
Dunning & Boschert Press Co., Inc., Syracuse, N. Y.
Farrel F. & M. Co., Ansonia, Conn.
Hydraulic Press Mfg. Co., The, Mt. Gilead, Ohio.
Myers, F. E., & Bro., Ashland, O.
Southwark Foundry & Machine Co., Philadelphia, Pa.
Watson-Stillman Co., The, New York.

Pumps—Centrifugal.

Southwark Foundry & Machine Co., Philadelphia, Pa.

Pumps—Vacuum.

Buffalo Fdy. & Mach. Co., Buffalo, N. Y.
Devine, J. P., Co., Buffalo, N. Y.

Racks and Frames.

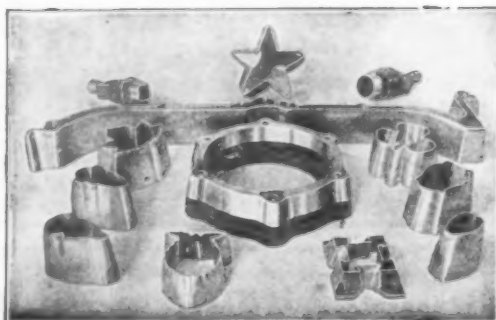
Hoggson & Pettis Mfg. Co., New Haven, Conn.

Reclaiming Machinery.

Adamson Machine Co., The, Akron, Ohio.
Allen Machine Co., Erie, Pa.
American Process Co., New York.
Riggs Roller Works Co., The, Akron, Ohio.
Birmingham Iron Foundry, Derby, Conn.
Buffalo Fdy. & Mach. Co., Buffalo, N. Y.
Devine, J. P. Co., Buffalo, N. Y.

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Any Size
Any Style

Tools
of
Quality



Ball Bearing
and
Plain Bearing



Rollers and Stitchers for the Rubber Trade

Iron MOLDS Steel

We manufacture Molds for Heels, Soles, Water Bottles, Nipples, Grips
and Other Mechanical Goods

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THE HOGGSON & PETTIS MFG. CO., New Haven, Conn., U. S. A.

SCOTT TESTERS



For testing tensile strength, elasticity, elongation, friction or adhesion, fatigue and recoverance. Adaptable to any style of pull test on rubber or textiles.

Over 20 years on the market and now standard equipment for most materials.

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101 Blackstone Street
Providence, R. I.

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Solvent Recovery Pay You?*

CONSIDER

Employees health,
Cost of solvent wasted,
Increased production,
Reduced fire hazard.



Benzine Condensation Co., Inc.
220 W. 42nd Street New York City
Telephone Bryant 3550

MYERS PUMPS FOR EVERY PURPOSE

Single and Double Acting Force and Lift, Hand, Windmill, Tank and Hydro-Pneumatic Pumps — Electric House Pumps and Direct Water Systems — Self-Oiling Bulldozer Power Pumps and Working Heads — Cylinders and Power Working Barrels — Spray Pumps and Accessories — Pipe and Well Fittings.

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ASHLAND PUMP & HAY TOOL WORKS

ASHLAND ESTABLISHED 1870 OHIO

DRYERS AND WATER SEPARATORS

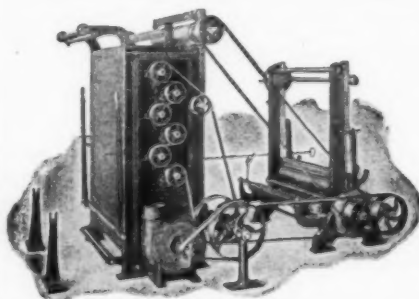
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RECLAIMED RUBBER

PRODUCES HIGHER GRADE MATERIAL
AT LOWER COST AND MORE EFFICIENT.

Material Carried in Stock for Standard Sizes

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68 WILLIAM ST., N. Y. CITY.



HEATH PATENT VERTICAL BRUSHES
With Calender Rolling Machine

CURTIS & MARBLE MACHINE CO. WORCESTER, MASSACHUSETTS

Brushing Machines, for cleaning goods to be coated; for brushing coated goods in connection with starch; or for cleaning cotton liners of soapstone, talc, etc.; Starching Attachments; Mill Sewing Machines, for stitching the ends of pieces together; Measuring Rolls and Dials; Rolling Machines; Inspecting Machines; Guide Frames; Machine Brushes of all kinds, etc.

The building of textile machinery for handling all varieties of cotton and other fabrics is our specialty.

RUBBER BUYERS' DIRECTORY—Continued

Reclaiming Machinery—Cont'd.

Farrel F. & M. Co., Ansonia, Conn.
Homatonic M. & T. Co., Bridgeport, Conn.
Taylor, Stiles & Co., Hiegalsville, N. J.
Vaughn Machinery Co., The, Cuyahoga Falls, Ohio.

Reclaiming Water Separators.

American Process Co., New York City.
Buffalo Foundry & Machine Co., Buffalo, N. Y.
Devine, J. P. Co., Buffalo, N. Y.
Vaughn Machinery Co., The, Cuyahoga Falls, Ohio.

Recording Instruments.

For Pressure and Temperature.
Bristol & Co., Waterbury, Conn.
Sandell, Frank E., Waltham, Mass.
Schaeffer & Budenberg Mfg. Co., The, Brooklyn, N. Y.
Tarnall-Waring Co., Philadelphia, Pa.

Refiners.

Allen Machine Co., Erie, Pa.
Birmingham Iron Foundry, Derby, Conn.
Farrel Foundry & Machine Co., Ansonia, Conn.
Vaughn Machinery Co., The, Cuyahoga Falls, Ohio.

Repair Equipment for Rubber Footwear.

Hoggson & Pettis Mfg. Co., The, New Haven, Conn.
Miller, Chas. E., Anderson, Ind.

Riveters.

Watson-Stillman Co., The, New York.

Rivets.

Sessions, J. H., & Son, Bristol, Conn.

Rollers and Stitchers—Hand.

Bruchard Mfg. Co., The, Canton, Ohio.
Hoggson & Pettis Mfg. Co., New Haven, Conn.
Miller, Chas. E., Anderson, Ind.
Wellman Co., Medford, Mass.

Rolls—Chilled.

Akron Rubber Mold & Machine Co., Akron, Ohio.
Allen Machine Co., Erie, Pa.
Birmingham Iron Foundry, Derby, Conn.
Curtis & Marble Mch. Co., Worcester, Mass.
Farrel Foundry & Machine Co., Ansonia, Conn.
Vaughn Machinery Co., The, Cuyahoga Falls, Ohio.

Rubber Covering Machines.

Daigger, A., & Co., Chicago, Ill.

Rubber Scrap Cutters.

Taylor, Stiles & Co., Hiegalsville, N. J.

Scleroscopes.

Shore Instrument & Mfg. Co., The, Jamaica, N. Y.

Sewing Machines.

Curtis & Marble Mch. Co., Worcester, Mass.

Shafting.

Adamson Machine Co., The, Akron, Ohio.
Allen Machine Co., Erie, Pa.
Birmingham Iron Foundry, Derby, Conn.
Farrel F. & M. Co., Ansonia, Conn.
Vaughn Machinery Co., The, Cuyahoga Falls, Ohio.

Sheet Metal Specialties

Brass Goods Mfg. Co., Brooklyn, N. Y.

Sherardizing.

New Haven Sherardizing Co., New Haven, Conn.

Shoe Cars and Sticks.

Birmingham Iron Foundry, Derby, Conn.
Hoggson & Pettis Mfg. Co., The, New Haven, Conn.
Ornamental Iron Work Co., Akron, Ohio.
Wellman Co., Medford, Mass.

Sifters—Dry.

Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Day, J. H. Co., Cincinnati, Ohio.

Skiving Machines.

Allen Machine Co., Erie, Pa.
United Shoe Machinery Corporation, Boston, Mass.

Slitting and Re-Winding Machines.

Cameron Machine Co., Brooklyn, N. Y.

Solvent Recovery Apparatus.

Reusine Condensation Co., New York.
Buffalo Foundry & Machine Co., Buffalo, N. Y.
Devine, J. P. Co., Buffalo, N. Y.

Special Machinery.

Akron Equipment Co., The, Akron, O.
Akron Gear & Engineering Co., The, Akron, Ohio.
Akron Machine, Mold, Tool & Die Co., Akron, Ohio.
Akron Rubber Mold & Mach. Co., Akron, Ohio.
Allen Machine Co., Erie, Pa.
Banner Machine Co., The, Columbiana, Ohio.

Biggs Boiler Works Co., The, Akron, Ohio.
Birmingham Iron Foundry, Derby, Conn.
Black Rock Mfg. Co., Bridgeport, Conn.
Bridgewater Machine Co., The, Akron, Ohio.

Farrel Foundry & Machine Co., Ansonia, Conn.
Frans Foundry & Machine Co., Akron, Ohio.

Hoggson & Pettis Mfg. Co., The, New Haven, Conn.
Kuhle Machine Co., Akron, Ohio.

Terkelsen Machine Co., Boston, Mass.
Vaughn Machinery Co., The, Cuyahoga Falls, Ohio.
Williams Foundry & Machine Co., The, Akron, Ohio.

Willis, Arthur Jackson, North Brookfield, Mass.

Sprayers.

Myers, F. E., & Bro., Ashland, Ohio.

Spreaders.

Adamson Machine Co., The, Akron, Ohio.
Banner Machine Co., The, Columbiana, Ohio.

Birmingham Iron Foundry, Derby, Conn.
Farrel Foundry & Machine Co., Ansonia, Conn.

New England Butt Co., Providence, R. I.
Vaughn Machinery Co., The, Cuyahoga Falls, Ohio.

Sprockets.

Spring Silent Chain. Compensating.
Morse Chain Co., Ithaca, N. Y.

Hoggson & Pettis Mfg. Co., The, New Haven, Conn.

Steel Stampings.

Independent Nail & Picking Co., Bridge-water, Mass.

Sessions, J. H., & Son, Bristol, Conn.

Steel Stamps.

Hoggson & Pettis Mfg. Co., New Haven, Conn.
Wellman Co., Medford, Mass.

Stitchers.

Akron Rubber Mold & Machine Co., Akron, Ohio.
Hoggson & Pettis Mfg. Co., New Haven, Conn.

Stock Bins and Shelves

Ornamental Iron Work Co., Akron, O.

Stock Shells.

Gammeter, W. F., Co., The, Cadiz, Ohio.
Ornamental Iron Works Co., Akron, Ohio.
Wade, Levi C., Lynn, Mass.

Strip Cutters.

Birmingham Iron Foundry, Derby, Conn.
Cameron Machine Co., Brooklyn, N. Y.
New England Butt Co., Providence, R. I.
Spadone Machine Co., Inc., New York.

Stripping Tables.

Akron Standard Mold Co., Akron, Ohio.
Banner Machine Co., The, Columbiana, Ohio.
Williams Foundry & Machine Co., The, Akron, Ohio.

Swing Joints.

Adamson Machine Co., The, Akron, Ohio.
Allen Machine Co., Erie, Pa.
Bridgewater Machine Co., The, Akron, Ohio.
Hydraulic Press Mfg. Co., The, Mount Gilead, Ohio.
Williams, Franklin, Inc., New York.

Tables—Cooling.

Ornamental Iron Work Co., Akron, Ohio.

Tachometers.

Schaeffer & Budenberg Mfg. Co., The, Brooklyn, N. Y.

Tanks, Storage—Oil and Gasoline.

Biggs Boiler Works Co., Akron, Ohio.
Heifner, J. C., Mfg. Co., Ashland, Ohio.

Testing Machines.

Daigger, A., & Co., Chicago, Ill.
Scott, Henry L., & Co., Providence, R. I.

Shore Instrument & Mfg. Co., The, Jamaica, N. Y.

Thermometers.

Daigger, A., & Co., Chicago, Ill.
Schaeffer & Budenberg Mfg. Co., The, Brooklyn, N. Y.

Tire Building Equipment.

Akron Equipment Co., The, Akron, O.
Banner Machine Co., The, Columbiana, Ohio.

Adamson Machine Co., The, Akron, Ohio.
Akron Rubber Mold & Machine Co., Akron, Ohio.

Akron Standard Mold Co., Akron, Ohio.
Allen Machine Co., Erie, Pa.
Birmingham Iron Foundry, Derby, Conn.
De Mattia Bros., Inc., Garfield, N. J.
Farrel Foundry & Machine Co., Ansonia, Conn.

Thropp's, John E., Sons So., The, Trenton, N. J.
Williams Fdy. & Mach. Co., Akron, O.

Tire Building Machines.

Banner Machine Co., The, Columbiana, Ohio.

Herman Tire Building Machine Co., The, Columbus, Ohio.

Thropp's, John E., Sons Co., The, Trenton, N. J.

Tire Building Stands.

Banner Machine Co., The, Columbiana, Ohio.

Bridgewater Machine Co., The, Akron, Ohio.

De Mattia Bros., Inc., Garfield, N. J.
Williams Foundry & Machine Co., The, Akron, Ohio.

Tire Fabric (Cord) Machine.

Olier, Etablissements A., Clermont-Ferrand, France.

Tire Lasts.

Miller, Chas. E., Anderson, Ind.
Williams Foundry & Machine Co., The, Akron, Ohio.

Tire Machine Drums.

Gammeter, W. F., Co., The, Cadiz, Ohio.

Tire Presses.

Adamson Machine Co., The, Akron, Ohio.
Akron Equipment Co., The, Akron, Ohio.

Allen Machine Co., Erie, Pa.
Birmingham Iron Foundry, Derby, Conn.
Dunning & Boschert Press Co., Inc., The, Columbus, O.

Farrel Foundry & Machine Co., Ansonia, Conn.

Hydraulic Press Mfg. Co., The, Mt. Gilead, Ohio.

Miller, Chas. E., Anderson, Ind.
Southward Foundry & Machine Co., Philadelphia, Pa.

Watson-Stillman Co., The, New York.

Williams Foundry & Machine Co., The, Akron, Ohio.

Tire Rebuilding and Repair Equipment.

Akron Rubber Mold & Mach. Co., The, Akron, O.

Biggs Boiler Works Co., The, Akron, O.
Frans Foundry & Machine Co., Akron, Ohio.

Hoggson & Pettis Mfg. Co., The, New Haven, Conn.

Miller, Chas. E., Anderson, Ind.
Williams, F. & M. Co., Akron, Ohio.

Tire Vulcanizing Presses.

The Adamson Machine Co., Akron, O.
Akron Equipment Co., The, Akron, O.

Allen Machine Co., Erie, Pa.
Birmingham Iron Foundry, Derby, Conn.

Hydraulic Press Mfg. Co., The, Mt. Gilead, Ohio.

Southward Foundry & Machine Co., Philadelphia, Pa.

Williams, F. & M. Co., Akron, Ohio.

Tire Wrapping Machines.

Adamson Machine Co., The, Akron, Ohio.
Akron Standard Mold Co., Akron, Ohio.

Allen Machine Co., Erie, Pa.
Banner Machine Co., The, Columbiana, Ohio.

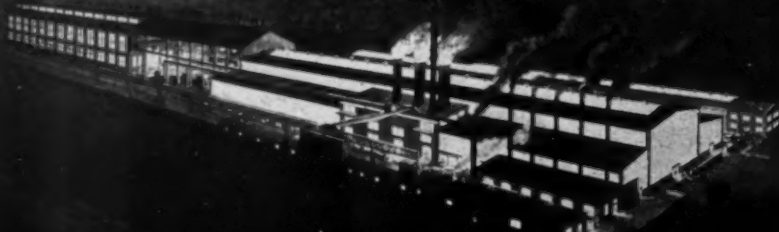
Miller, Chas. E., Anderson, Ind.
Pierce Wrapping Mach. Co., Chicago, Ill.

Terkelsen Machine Co., Boston, Mass.
Thropp's, John E., Sons Co., Trenton, N. J.

For Complete Addresses See Advertisements—Index Page 73

Highest Attainment in VACUUM DRYER Construction

ACHIEVED AND PATENTED BY
**BUFFALO FOUNDRY
AND MACHINE
COMPANY**
BUFFALO, N. Y.
NEW YORK OFFICE
1432 WHITEHALL BUILDING
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"THE PLANT BEHIND THE APPARATUS"

Safety Plus Simplicity

Biggs Vulcanizers are equipped with the Simplex Boltless Vulcanizer Door, combining maximum safety with simplicity of operation.

Entirely self contained, the Simplex Door can be easily opened or closed by one man in less than thirty seconds, an exclusive Simplex feature. It is made of cast steel throughout and is free from all annoying adjustment devices. Fully guaranteed.

Particulars and prices on Biggs Vulcanizers, and Devulcanizers, Simplex Doors, Biggs Steel Storage and Pressure Tanks, and special Steel Plate Construction gladly given at your request.

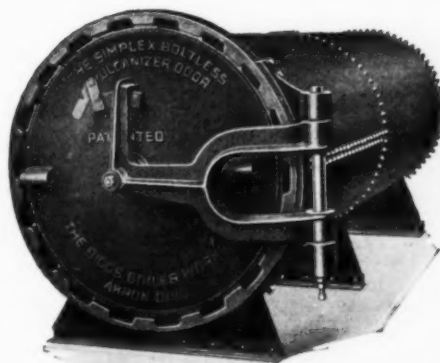
THE BIGGS BOILER WORKS CO.

Case Ave. and B. & O. R.R.

Akron, Ohio



BIGGS VULCANIZERS



Biggs Vulcanizer equipped with Simplex Boltless Vulcanizer Door. Accepted by The Hartford Steam Boiler Inspection and Insurance Company.



"Biggs" Extra Heavy Oil and Gasoline Storage Tanks

Write for Price-Lists cover 38 standard sizes

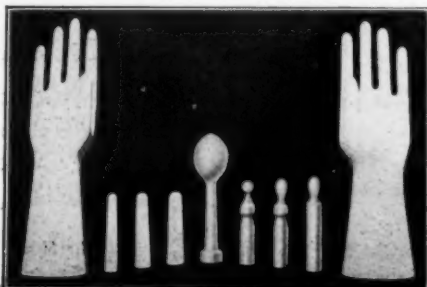
THE BIGGS BOILER WORKS CO., Tank Dept., Akron, O.

S. P. VITRIFIED PORCELAIN FORMS

GUARANTEED AGAINST CRAZING

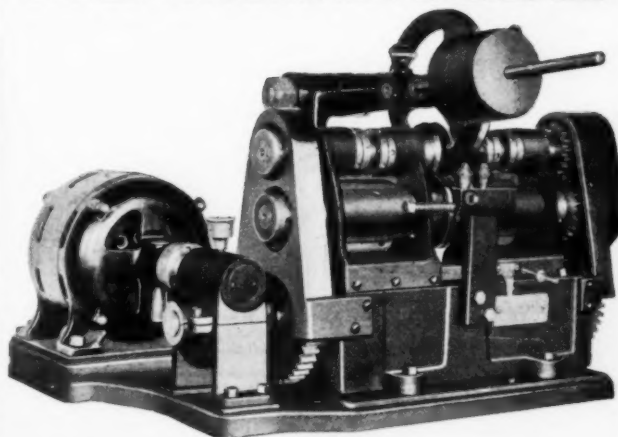
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Manager's experience 18 years. Write us your wants.



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BEAD TRIMMING MACHINES



MOTOR DRIVE
\$368

PATENTED

BELT DRIVE
\$258

*Will Trim Straight Side or Clincher Beads
Capacity 800 Per Hour*

MOLDS AND CORES

THE BRIDGWATER MACHINE CO.
AKRON, OHIO

RUBBER BUYERS' DIRECTORY — Continued

Transmission (Silent) Chains.

Morse Chain Co., Ithaca, N. Y.

Transmission Machinery.

Allen Machine Co., Erie, Pa.
 Allis-Chalmers Mfg. Co., Milwaukee, Wis.
 Birmingham Iron Foundry, Derby, Conn.
 Farrel Foundry & Machine Co., Ansonia, Conn.
 Morse Chain Co., Ithaca, N. Y.

Tread Making Machines.

Allen Machine Co., Erie, Pa.
 Birmingham Iron Foundry, Derby, Conn.
 Vaughn Machinery Co., The, Cuyahoga Falls, Ohio.

Trimmers.

Banner Machine Co., The, Columbiana, Ohio.
 Bridgewater Machine Co., The, Akron, Ohio.
 Morris, T. W., Chicago, Ill.
 Wills, Arthur Jackson, North Brookfield, Mass.

Tube Wrapping Machines.

Akron Rubber Mold & Machine Co., Akron, Ohio.
 Akron Standard Mold Co., Akron, Ohio.
 Allen Machine Co., Erie, Pa.
 Banner Machine Co., The, Columbiana, Ohio.
 Black Rock Mfg. Co., The, Bridgeport, Conn.
 Williams Foundry & Machine Co., The, Akron, Ohio.

Tubing Machines.

Adamson Machine Co., Akron, O.
 Akron Rubber Mold & Machine Co., Akron, O.
 Allen Machine Co., Erie, Pa.
 Farrel Foundry & Machine Co., Ansonia, Conn.
 Housatonic Mach. & Tool Co., Bridgeport, Conn.
 Royle, John, & Sons, Paterson, N. J.
 Williams Foundry & Machine Co., Akron, Ohio.

Turbines—Steam.

Allis-Chalmers Mfg. Co., Milwaukee, Wis.

Vacuum Cloth Impregnating Equipment.

Banner Machine Co., The, Columbiana, Ohio.

Buffalo Foundry & Machine Co., Buffalo, N. Y.
 Devine, J. P., Co., Buffalo, N. Y.
 Shaw, Francis, & Co., Ltd., Manchester, England.

Valve Grinders.

Hydraulic Press Mfg. Co., The, Mount Gilead, Ohio.
 Pittsburgh Valve Foundry & Construction Co., Pittsburgh, Pa.
 Quaker City Rubber Co., Philadelphia, Pa.

Valves.

Dunning & Boschert Press Co., Inc., The, Syracuse, N. Y.
 Pittsburgh Valve Foundry & Construction Co., Pittsburgh, Pa.
 Southwark Foundry & Machine Co., Philadelphia, Pa.
 Utility Manufacturing Co., Cudahy, Wis.
 Yarnall-Waring Co., Philadelphia, Pa.

Valves (Reducing).

Mason Regulator Co., Dorchester, Mass.

Valves—Two Pressure

Pittsburgh Valve Foundry & Construction Co., Pittsburgh, Pa.
 Yarnall-Waring Co., Philadelphia, Pa.

Varnishing Machines.

Birmingham Iron Foundry, Derby, Conn.

Vulcanizers.

Adamson Machine Co., Akron, O.
 Akron Equipment Co., The, Akron, Ohio.
 Akron Rubber Mold & Machine Co., Akron, O.
 Allen Machine Co., Erie, Pa.
 Biggs Boiler Works Co., Akron, O.
 Birmingham Iron Foundry, Derby, Conn.
 Devine, J. P., Co., Buffalo, N. Y.
 Farrel F. & M. Co., Ansonia, Conn.
 Fisk Rubber Co., Chicopee Falls, Mass.
 Miller, Chas. E., Anderson, Ind.
 Southwark Fdy. & Mach. Co., Phila., Pa.
 Thropp's, John E., Sons Co., Trenton, N. J.

Vulcanizers—Continued.

Thropp, William R., Sons' Co., Trenton, N. J.
 Williams F. & M. Co., Akron, Ohio.

Washers.

Adamson Machine Co., The, Akron, Ohio.
 Allen Machine Co., Erie, Pa.
 Birmingham Iron Foundry, Derby, Conn.
 Bridge, David, & Co., Castleton, Manchester, Eng.
 Buffalo Foundry & Machine Co., Buffalo, N. Y.
 Devine, J. P., Co., Buffalo, N. Y.
 Farrel F. & M. Co., Ansonia, Conn.
 Shaw, Francis, & Co., Ltd., Manchester, England.

Thropp's, John E., Sons Co., Trenton, N. J.
 Thropp, William R., Sons' Co., Trenton, N. J.
 Vaughn Machinery Co., The, Cuyahoga Falls, Ohio.

Washers—Light Steel for Rubber Heels.

Independent Nail & Packing Co., Bridge-water, Mass.
 Sessions, J. H., & Son, Bristol, Conn.

Worm Drives

Cleveland Worm and Gear Co., The, Cleveland, Ohio.

Wrapping Machines.

Adamson Machine Co., Akron, O.
 Allen Machine Co., Erie, Pa.
 Banner Machine Co., The, Columbiana, Ohio.
 Birmingham Iron Foundry, Derby, Conn.
 Farrel F. & M. Co., Ansonia, Conn.
 Miller, Chas. E., Anderson, Ind.

Wrapping Machines.

For Wrapping Bundles of Tires, Hose and Wire.
 Torkelson Machine Co., Boston, Mass.

Wrapping Machines—Paper.

Pierce Wrapping Machine Co., Chicago, Ill.
 Torkelson Machine Co., Boston, Mass.

SECOND-HAND MACHINERY

Albert, L., & Son, Trenton, N. J.
 Gross, Russell R., Co., Akron, Ohio.
 McGroarty, Philip, Trenton, N. J.
 Norton, M., & Co., Medford, Mass.
 Rubber Machinery & Equipment Co., Newark, N. J.

RAW MATERIALS AND SUPPLIES**Accelerators.**

American Oil & Supply Co., Trenton, N. J.
 Butcher, L. H., Co., Inc., New York. (Vul Ko Cene.)
 Daigger, A., & Co., Chicago, Ill. (Adeo.)
 Gray, William S., & Co., New York.
 National Aniline & Chemical Co., New York.
 Naugatuck Chemical Co., Naugatuck, Conn. (N. C. C.)
 Oregon Volcanic-Tuff Products Co., Mt. Angel, Ore.
 Pfaltz & Bauer, Inc., New York.
 Roessler & Hasselacher Chemical Co., New York.
 Rubber Service Laboratories Co., The, Akron, Ohio.
 States Metals Co., New York.
 Tidewater Chemical Co., Inc., New York.
 Vul Ko Cene Co., The, Kent, Ohio. (Vul Ko Cene.)
 Wishnick-Tumpeier Chemical Co., Chicago, Ill.

Acids.

Cooper, Chas., & Co., New York.
 Daigger, A., & Co., Chicago, Ill.
 National Aniline & Chemical Co., New York.
 Naugatuck Chemical Co., Naugatuck, Conn.
 Pfaltz & Bauer, Inc., New York.
 Wishnick-Tumpeier Chemical Co., Chicago, Ill.

For Complete Addresses See Advertisements—Index Page 73

Established 1866

Incorporated 1919

The Kuhlke Machine Co.

Formerly Jones & Kuhlke

Automobile Tire Molds and Cores**GENERAL MACHINE WORK**

Cor. W. Exchange & Water Sts. AKRON, OHIO

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Racks and Formholders

Shoe Cars and Sticks
 Mill-Room Cooling Tables
 Stock-Bins, Compound Boxes

Stock Shells, Mold Racks, Lockers, Etc.

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OHIO

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MANUFACTURERS OF

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 STRIP COVERING MACHINES
RUBBER
 SPREADING MACHINES
RUBBER
 HOSE BRAIDERS

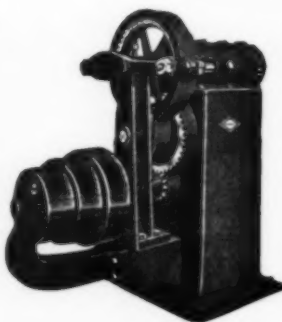
Manufacturers of the

"HOUSATONIC"

Insulating, Tubing
 and Rubber Strain-
 ing Machines.

The Housatonic Machine
 and Tool Co.

Bridgeport, Conn.



THE WELLMAN COMPANY

are manufacturers of

**THE WELLMAN SOLE
CUTTING MACHINE**

AND

**THE PATTEN SOLE
CUTTING MACHINE**

for cutting soles, taps and other irregular shapes at any bevel from 27° to 90° from sheet stock. They are also in a position to work out many of your engineering problems, to design and build any tool or light machine needed in your factory.

Send blue prints
of requirements to

WELLMAN COMPANY

Engineers and Machinists
MEDFORD, MASS.

HEXAMETHYLENE TETRAMINE

Well known, popular organic vulcanization accelerator. Particularly adapted for stocks requiring high tensile properties.

FORMALDEHYDE

For rubber compounders who prefer to make their own formaldehyde—aniline accelerator.

William S. Gray & Co.

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OHMLAC

Hydrocarbon Compounds
Mineral Rubber
Kapak

Those who want *the best* come to OHMLAC
—and get it.

Write us today about your requirements.

Ohmlac Paint & Refining Co.

Refinery and Manufacturing Plant: Clearing, Ill.
General Offices—Marquette Building, Chicago

J. LEE SMITH & COMPANY

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Strong Red Oxides of Iron

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THE TWEEDY COMPANY,
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WILLIAM W. SIME
707 Star Building
St. Louis, Missouri

GEORGE F. SMITH
601 Empire Building
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The Efficiency Rubber Gauge (The Randall and Stickney Thickness Gauge)

With this Gauge the thickness of rubber is determined within .001 inch, and there is no personal factor to be considered.



This instrument has been in use by the leading Rubber Manufacturers of this country and Canada for fifteen years.

Operated by a Standard Pressure on a Standard Area
Send for Descriptive Circular and Prices

FRANK E. RANDALL, Waltham, Mass.

RUBBER BUYERS' DIRECTORY — Continued

Acids—Sulphuric.

Daigger, A. & Co., Chicago, Ill.
 Mineral Point Zinc Co., Chicago, Ill.
 New Jersey Zinc Co., New York.
 Pfaltz & Bauer, Inc., New York.
 Scheel, William H., New York.

Alba Whiting.

Daigger, A. & Co., Chicago, Ill.
 Harshaw, Fuller & Goodwin Co., The
 Cleveland, Ohio.
 Industrial Chemical Co., New York.
 Pfaltz & Bauer, Inc., New York.
 Roessler & Hasslacher Chemical Co.,
 New York.
 Whittaker, Clark & Daniels, Inc., New
 York.
 Wishnick-Tumpeur Chemical Co., Chi-
 cago, Ill.

Aluminum Flake.

Aluminum Flake Co., The, Akron, O.
 Butcher, L. H., Co., Inc., New York.
 Rubber Service Laboratories Co., Akron,
 Ohio.

Scheel, William H., New York.
 Whittaker, Clark & Daniels, Inc., New
 York.

Aniline Oil.

American Oil & Supply Co., Trenton,
 N. J.
 Daigger, A. & Co., Chicago, Ill.
 Innis, Spelden & Co., Inc., New York
 City.

National Aniline & Chemical Co., New
 York.
 Naugatuck Chemical Co., Naugatuck,
 Conn.
 Pfaltz & Bauer, Inc., New York.
 Rubber Service Laboratories Co., Inc.,
 The, Akron, Ohio.
 Scheel, William H., New York.
 Tidewater Chemical Co., Inc., New York.
 Wishnick-Tumpeur Chemical Co., Chi-
 cago, Ill.

Antimony, Sulphurets of.

Golden and Crimson.
 American Oil & Supply Co., Trenton,
 N. J.
 Atlas Chemical Co., Waltham, Mass.
 Butcher, L. H., Co., Inc., New York.
 Cooper, Charles, & Co., New York.
 Daigger, A. & Co., Chicago, Ill.
 Harshaw, Fuller & Goodwin Co., Cleve-
 land, Ohio.
 Innis, Spelden & Co., Inc., New York
 City.

**Antimony—Sulphurets of—Con-
tinued.**

Naugatuck Chemical Co., Naugatuck,
 Conn.
 Pfaltz & Bauer, Inc., New York.
 Rare Metal Products Co., Belleville, N. J.
 Reichard-Coulston, Inc., New York.
 Roessler & Hasslacher Chemical Co.,
 New York.
 Rubber Service Laboratories, The, Akron,
 Ohio.
 Scheel, William H., New York.
 States Metals Co., New York.
 Tidewater Chemical Co., Inc., New York.
 Typke & King, Ltd., Mitcham, England.
 Tyson Bros., Inc., Woodbridge, N. J.
 Wishnick-Tumpeur Chemical Co., Chi-
 cago, Ill.

Arsenic, Yellow

Butcher, L. H., Co., Inc., New York.

Artificial Rubber.

Ashley, T. C., & Co., Boston, Mass.
 Carter Bell Mfg. Co., New York.
 Scheel, William H., New York.
 Stamford Rubber Supply Co., Stamford,
 Conn.
 Typke & King, London, England.
 Tyson Bros., Inc., Woodbridge, N. J.
 Wishnick-Tumpeur Chemical Co., Chi-
 cago, Ill.

Asbestine.

American Oil & Supply Co., Trenton,
 N. J.
 Butcher, L. H., Co., Inc., New York.
 Daigger, A. & Co., Chicago, Ill.
 Harshaw, Fuller & Goodwin Co., The,
 Cleveland, Ohio.
 Innis, Spelden & Co., Inc., New York
 City.
 Scheel, William H., New York.
 Tidewater Chemical Co., Inc., New York.
 Whittaker, Clark & Daniels, Inc., New
 York.
 Williams, C. K., & Co., Easton, Pa.
 Wishnick-Tumpeur Chemical Co., Chicago,
 Ill.

Balata.

Aslett & Co., H. A., New York.
 Chipman, B. L., New York.
 Dunbar, J. Frank, Co., Inc., New York.

Balata—Continued.

Hardy, R. S., Co., New York City.
 Jacoby, Ernest, Boston, Mass.
 Pell & Dumont, New York.
 Wood, Charles E., New York.

Barium Dust.

Vanderbilt, R. T., Co., New York.

Barium Sulphate—See Barytes**Barium Sulphate Precipitated—
See Blanc Fixe****Barytes.**

American Oil & Supply Co., Trenton,
 N. J.
 Butcher, L. H., Co., Inc., New York.
 Daigger, A. & Co., Chicago, Ill.
 Harshaw, Fuller & Goodwin Co., Cleve-
 land, Ohio.
 Innis, Spelden & Co., Inc., New York
 City.
 Osborn, C. J., Co., New York.
 Pfaltz & Bauer, Inc., New York.
 Reichard-Coulston, Inc., New York.
 Roessler & Hasslacher Chemical Co.,
 New York.
 Scheel, William H., New York, N. Y.
 Tidewater Chemical Co., Inc., New York.
 Tyson Bros., Inc., Woodbridge, N. J.
 Vanderbilt, R. T., Co., New York.
 Waldo, E. M. & F., New York.
 Whittaker, Clark & Daniels, Inc., New
 York.
 Wishnick-Tumpeur Chemical Co., Chi-
 cago, Ill.

Basofor.

Waldo, E. M. & F., New York.

Benzol.

Cabot, Samuel, Boston, Mass.
 Cooper, Charles, & Co., New York.
 Daigger, A. & Co., Chicago, Ill.
 Harshaw, Fuller & Goodwin Co., The,
 Cleveland, Ohio.
 Scheel, William H., New York.
 Tidewater Chemical Co., Inc., New York.
 Tyson Bros., Inc., Carteret, N. J.
 Wishnick-Tumpeur Chemical Co., Chi-
 cago, Ill.

Black Hypo.

Butcher, L. H., Co., Inc., New York.
 Daigger, A. & Co., Chicago, Ill.
 Harshaw, Fuller & Goodwin Co., The,
 Cleveland, Ohio.
 Pfaltz & Bauer, Inc., New York.
 Reichard-Coulston, Inc., New York.
 Scheel, William H., New York.
 Tidewater Chemical Co., Inc., New York.
 Typke & King, London, England.
 Wishnick-Tumpeur Chemical Co., Chi-
 cago, Ill.

Blanc Fixe.

Butcher, L. H., Co., Inc., New York.
 Cooper, Charles, & Co., New York.
 Daigger, A. & Co., Chicago, Ill.
 Harshaw, Fuller & Goodwin Co., Cleve-
 land, Ohio.
 Innis, Spelden & Co., Inc., New York
 City.
 Reichard-Coulston, Inc., New York.
 Tidewater Chemical Co., Inc., New York.
 Vanderbilt, R. T., Co., New York.
 Waldo, E. M. & F., New York.
 Whittaker, Clark & Daniels, Inc., New
 York.
 Wishnick-Tumpeur Chemical Co., Chi-
 cago, Ill.

Bolted Lime.

American Oil & Supply Co., Trenton,
 N. J.
 Butcher, L. H., Co., Inc., New York.
 Daigger, A. & Co., Chicago, Ill.
 Pfaltz & Bauer, Inc., New York.
 Tidewater Chemical Co., Inc., New York.
 Whittaker, Clark & Daniels, Inc., New
 York.
 Wishnick-Tumpeur Chemical Co., Chi-
 cago, Ill.

Bone Ash.

Cooper, Chas., & Co., New York.
 Daigger, A. & Co., Chicago, Ill.

Cadmium Yellow.

Butcher, L. H., Co., Inc., New York.
 Daigger, A. & Co., Chicago, Ill.
 Harshaw, Fuller & Goodwin Co., The,
 Cleveland, Ohio.
 Innis, Spelden & Co., Inc., New York
 City.

For Complete Addresses See Advertisements—Index Page 73

WISHNICK-TUMPEUR CHEMICAL COMPANY

GENUINE LAGOS PALM OIL

Spot Stocks and Shipment from Works

Davenport Ave. & E. 14th St., CLEVELAND, OHIO

365 E. Illinois St., CHICAGO, ILLINOIS

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GOLDEN
CRIMSON
VERMILION

"TYPKE & KING'S"

ANTIMONIES

ORIGINAL
STANDARDS
UNEXCELLED

YOUR GUARANTEE



WE ARE EXCLUSIVE AGENTS CARRYING

NEW YORK STOCKS

LOOK FOR THE SEAL—NOT GENUINE WITHOUT IT

RED OXIDES

YOU CAN PAY MORE BUT YOU
CAN'T GET MORE THAN WE DELIVER

INDIAN RED

THE ACCELERATOR **VUL-KO-CENE** "HAS MADE GOOD"

(See Page 10)

There is no necessity of developing a second grade, the present standard is O. K.
 For those who buy it for "results" rather than "for information."

WHITES

Asbestine, Barytes, Clay, Fossil Flour, Lime,
 Lithopone, Magnesia, Mica, Soapstone, Talc,
 Whiting, Zinc, Oxide and "TO" Pigment.

COLORS

FOR ALL HOT OR COLD CURES
 Including Arsenic Lemon and Orange, Cad-
 mium Sulphide, Chromium Oxide, Etc., Etc.

BLACKS

Bone, Carbon, Hypo, Lamp, Iron Oxide,
 Graphite, Vegetable, Mineral Rubber—Solid
 and Granulated Hydro Carbons.



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SAN FRANCISCO

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 Phone 6732 Beekman

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CARBON BLACKS

We manufacture and sell Carbon Black
from Natural Gas

HIGH GRADE PRODUCT

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ADDRESS INQUIRIES

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BOSTON BUFFALO CHICAGO NEW YORK PHILADELPHIA

MAGNESIA

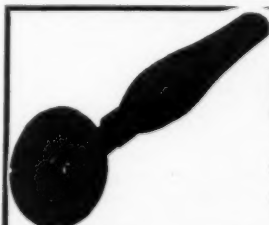
WHITTAKER, CLARK & DANIELS, Inc.
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Established 1873

Cable Address,
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BUY AND SELL RUBBER SCRAP
30 Church Street, New York, U. S. A.



Better Tires

"Diamond E"

Less Energy

Ball Bearing Stitchers and Hand Rollers

We make all standard types and sizes, or special tools to order. Write for price list. Used by the largest Akron tire companies.

THE EVERHARD MFG. CO.

Canton, Ohio



RUBBER BUYERS' DIRECTORY — Continued

Cadmium Yellow—Continued.

Pfaltz & Bauer, Inc., New York.
Reichard-Coulston, Inc., New York.
Roessler & Hasselacher Chemical Co., New York.
Tidewater Chemical Co., Inc., New York.
Waldo, E. M. & F., New York.
Wishnick-Tumpeier Chemical Co., Chicago, Ill.

Carbon Bisulphide and Tetrachloride.

Cooper, Charles, & Co., New York.
Daigger, A., & Co., Chicago, Ill.
Harshaw, Fuller & Goodwin Co., The, Cleveland, Ohio.
Innis, Spelden & Co., Inc., New York City.
National Aniline & Chemical Co., New York.
Pfaltz & Bauer, Inc., New York.
Roessler & Hasselacher Chemical Co., New York.
Tidewater Chemical Co., Inc., New York.
Wishnick-Tumpeier Chemical Co., Chicago, Ill.

Carbon Black.

Binney & Smith Co., New York.
Butcher, L. H., Co., Inc., New York.
Cabot, Godfrey L., Boston, Mass.
Daigger, A., & Co., Chicago, Ill.
Harshaw, Fuller & Goodwin Co., The, Cleveland, Ohio.
Industrial Chemical Co., New York.
Innis, Spelden & Co., Inc., New York City.
Nelson, Oscar, Charleston, W. Va.
Osborn, C. J., Co., New York.
Pfaltz & Bauer, Inc., New York.
Reichard-Coulston, Inc., New York.
Roessler & Hasselacher Chemical Co., New York.
Scheel, William H., New York.
Seaver & Co., Boston, Mass.
Tidewater Chemical Co., Inc., New York.
Union Chemical Co., Boston, Mass.
West Co., W. T., Boston, Mass.
Whittaker, Clark & Daniels, Inc., New York.
Wishnick-Tumpeier Chemical Co., Chicago, Ill.

Caustic Soda.

American Oil & Supply Co., Trenton, N. J.
Cooper, Charles, & Co., New York.
Daigger, A., & Co., Chicago, Ill.
Harshaw, Fuller & Goodwin Co., The, Cleveland, Ohio.
Innis, Spelden & Co., Inc., New York City.
Scheel, William H., New York.
Tidewater Chemical Co., Inc., New York.
Wishnick-Tumpeier Chemical Co., Chicago, Ill.

Cement (Rubber).

Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Essex Rubber Co., Trenton, N. J.
Hale, Alfred, Rubber Co., Boston, Mass.
New York Belting & Packing Co., N. Y.
United States Rubber Co., New York.

Cement Cans.

Heifner, J. C., Mfg. Co., Akron, Ohio.

Chemicals and Ingredients.

Ashley, T. C., & Co., Boston, Mass.
Binney & Smith Co., New York.
Butcher, L. H., Co., Inc., New York.
Cooper, Charles, & Co., New York.
Daigger, A., & Co., Chicago, Ill.
Harshaw, Fuller & Goodwin Co., Cleveland, Ohio.
Innis, Spelden & Co., Inc., New York City.
Kilpstein, A., & Co., New York City.
National Aniline & Chemical Co., New York.
Oregon Volcanic-Tuff Products Co., Mt. Angel, Ore.
Osborn, C. J., Co., New York.
Pfaltz & Bauer, Inc., New York.
Roessler & Hasselacher Chemical Co., New York.
States Metals Co., New York.
Tidewater Chemical Co., Inc., New York.
Tyson Bros., Inc., Woodbridge, N. J.
Waldo, E. M. & F., New York.

Chemicals & Ingredients—Cont'd

Westmoreland Chemical & Color Co., Philadelphia, Pa.
Whittaker, Clark & Daniels, Inc., New York.
Williams, C. K., & Co., Easton, Pa.
Wishnick-Tumpeier Chemical Co., Chicago, Ill.

China Clay.

Butcher, L. H., Co., Inc., New York.
Daigger, A., & Co., Chicago, Ill.
Harshaw, Fuller & Goodwin Co., The, Cleveland, Ohio.
Innis, Spelden & Co., Inc., New York City.
Pfaltz & Bauer, Inc., New York.
Reichard-Coulston, Inc., New York.
Roessler & Hasselacher Chemical Co., New York.
Rubber Service Laboratories, The, Akron, Ohio.
Scheel, William H., New York, N. Y.
Taintor Mfg. Co., H. F., New York.
Tidewater Chemical Co., Inc., New York.
Vanderbilt, B. T., Co., New York.
Whittaker, Clark & Daniels, Inc., New York.
Williams & Co., C. K., Easton, Pa.
Wishnick-Tumpeier Chemical Co., Chicago, Ill.

Colors.

Ault & Wiborg Co., The, Cincinnati, Ohio.
Binney & Smith Co., New York.
Butcher, L. H., Co., Inc., New York.
Cooper, Charles, & Co., New York.
Daigger, A., & Co., Chicago, Ill.
Harshaw, Fuller & Goodwin Co., The, Cleveland, Ohio.
Innis, Spelden & Co., Inc., New York City.
McNulty, Joseph A., New York.
National Aniline & Chemical Co., New York.
Osborn, C. J., Co., New York.
Pfaltz & Bauer, Inc., New York.
Reichard-Coulston, Inc., New York.
Roessler & Hasselacher Chemical Co., New York.
Rubber Service Laboratories, The, Akron, Ohio.

Colors—Continued.

Scheel, William H., New York.
Smith, J. Lee, & Co., New York.
States Metals Co., New York.
Tidewater Chemical Co., Inc., New York.
Typke & King, London, England.
Tyson Bros., Inc., Woodbridge, N. J.
Waldo, E. M. & F., New York.
Westmoreland Chem. & Color Co., Philadelphia, Pa.
Whittaker, Clark & Daniels, Inc., New York.
Williams, C. K., & Co., Easton, Pa.
Wishnick-Tumpeier Chemical Co., Chicago, Ill.

Cotton Goods.

Ducks and Drills.

Adams, H. J., Co., The, Akron, Ohio.
Burr, Albert E., Co., New York.
Curran & Barry, New York.
Davis, Poncet, Co., Akron, Ohio.
Hewins, E. D., Boston, Mass.
Kavanaugh, Geo. W., New York.
Lane, J. H., & Co., New York.
Lawrence & Co., New York.
Meyer, John H., & Co., New York.
Tire Tape.
Adams, H. J., Co., The, Akron, Ohio.
Davis, Poncet, Co., Akron, Ohio.
Kavanaugh, Geo. W., New York.
Hollands.
Davis, Poncet, Co., Akron, Ohio.
Kavanaugh, Geo. W., New York.

Osanaburgs.
Adams, H. J., Co., The, Akron, Ohio.
Curran & Barry, New York.
Davis, Poncet, Co., Akron, Ohio.
Kavanaugh, Geo. W., New York.
Sheetings.
Adams, H. J., Co., The, Akron, Ohio.
Davis, Poncet, Co., Akron, Ohio.
Kavanaugh, Geo. W., New York.
Stockinettes.
United States Knitting Co., Pawtucket, R. I.
Tire Fabric.
Adams, H. J., Co., The, Akron, Ohio.
Bibb Mfg. Co., Macon, Ga.
Brighton Mills, Passaic, N. J.

For Complete Addresses See Advertisements—Index Page 73

ALBERT E. BURR CO.

Cotton Fabrics and Yarns

The Equitable Trust Building, Madison Ave. and 45th St., New York City

Cord Yarn and Cord Fabric for Cord Tires

All yarn and fabric constructions, in Peeler, Egyptian and Sea Island

RUBRAX

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ELASTIC
Hydro-Carbons

Plants and Branches at
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CARTERET, NEW JERSEY
PHILADELPHIA, PENNSYLVANIA



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Trenton, N. J.

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THE INTEROCEAN OIL COMPANY

90 West Street, NEW YORK

**A SUPERIOR LINE OF
Stockinettes and Jersey
Cloths, Cotton, Wool
and Worsted**

adapted to the requirements of
Rubber Goods Manufacturers

**Linings for Footwear a
Specialty**

Made by the

UNITED STATES KNITTING CO.
PAWTUCKET RHODE ISLAND

Akron Representative, A. L. PARDEE, 512 Ohio Bldg.,
Akron, Ohio

ESTABLISHED 1888

We have what you need in

Lithopone

(Rubber Makers White)

Paris White

Imported Whiting

Powdered English China

Clay

Terra Alba

Talc

*Samples and prices are ready
for you. Why not learn
what we can do for you?*

Reichard-Coulston, Inc.

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BOSTON, MASS.

KIRBY BLDG.,
CLEVELAND, OHIO

95 MADISON AVE.,
NEW YORK CITY

**ATTENTION RUBBER
MANUFACTURERS**

We carry in stock or can furnish at short
notice any kind of

Crude Rubber WASHED AND DRIED

Fine Para a specialty

Send us your inquiries.

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NEW YORK CITY

FACTORY AT LODI, N. J.

The W.F. Gammeter Company

**Universal Calender Shells and
Tire Machine Drums**

(PATENTED)

CADIZ, OHIO, U. S. A.

A Complete Line of

COTTONS YARNS

FABRICS

TAPES AND HOLLANDS

FOR THE RUBBER TRADE

PONCET DAVIS COMPANY

Central Sav. & Trust Bldg.

Akron, Ohio

and 350 Broadway, New York City

RUBBER BUYERS' DIRECTORY—Continued

Cotton Goods—Continued.

Tire Fabrics—Continued.

Burr, Albert E., & Co., New York.
 Caldwell, R. J., Co., Inc., New York.
 Cabarrus Cotton Mills, Kannapolis, N. C.
 Davis, Poncet, Co., Akron, Ohio.
 Hewins, E. D., Inc., Boston, Mass.
 Jencks Spinning Co., Pawtucket, R. I.
 Kavanaugh, Geo. W., New York.
 Lane, J. H., & Co., New York.
 Lawrence & Co., New York.
 Manhasat Mfg. Co., Providence, R. I.
 Marlboro Cotton Mills, McColl, S. C.
 Meyer, John H., & Co., New York.
 Salmon Falls Mfg. Co., Boston, Mass.
 Taylor, Armitage & Bagley, Inc., New York.
 Worcester Tire Fabric Co., Worcester, Mass.

Yarns.

Burr, Albert E., Co., New York.
 Davis, Poncet, Co., Akron, Ohio.
 Lane, J. H., & Co., New York.

Crude Rubber—Importers and Exporters.

Astlett, H. A., & Co., New York.
 Baird Rubber & Trading Co., New York.
 Hankin, Geo., & Co., London, England.
 Henderson, F. R., & Co., New York.
 Hirsch, Adolph, & Co., New York.
 Mid East Trading Co., Singapore, S. S.
 Stiles, William H., & Co., New York.
 Wilson Co., Charles T., Inc., New York.

Crude Rubber Brokers.

Chipman, R. L., New York.
 Dunbar, F. W., & Co., New York.
 Dunbar, J. Frank, Co., Inc., New York.
 Hardy, Roger S., New York.
 Jacoby, Ernest, Boston, Mass.
 Odell, Jas. E., Boston, Mass.
 Pell & Dumont, New York.
 Stedman, Arthur W., Inc., New York.
 Wilson Co., Charles T., Inc., New York.

Crude Rubber—Washed and Dried.

Acushnet Process Co., New Bedford, Mass.
 Continental Rubber Co., New York.
 Calvet, Pablo & Co., New York, N. Y.

Diatomite.

Butcher, L. H., Co., Inc., New York.
 Whittaker, Clark & Daniels, Inc., New York.

Fillers.

American Oil & Supply Co., Trenton, N. J.
 Butcher, L. H., Co., Inc., New York.
 Daigger, A., & Co., Chicago, Ill.
 Innis, Spelden & Co., Inc., New York.
 Oregon Volcanic-Tuff Products Co., Mt. Angel, Ore.

Fillers—Continued

Pfaltz & Bauer, Inc., New York.
 Tidewater Chemical Co., Inc., New York.
 Whittaker, Clark & Daniels, Inc., New York.

Fossil Flour—Infusorial Earth.

American Oil & Supply Co., Trenton, N. J.
 Butcher, L. H., Co., Inc., New York.
 Daigger, A., & Co., Chicago, Ill.
 Harshaw, Fuller & Goodwin Co., The, Cleveland, Ohio.
 Pfaltz & Bauer, Inc., New York.
 Scheel, William H., New York.
 Tidewater Chemical Co., Inc., New York.
 Whittaker, Clark & Daniels, Inc., New York.

Gilsonite.

Daigger, A., & Co., Chicago, Ill.
 Scheel, William H., New York.
 Tidewater Chemical Co., Inc., New York.
 Wishnick-Tumpeur Chemical Co., Chicago, Ill.

Graphite.

Butcher, L. H., Co., Inc., New York.
 Daigger, A., & Co., Chicago, Ill.
 Innis, Spelden & Co., Inc., New York.
 Tidewater Chemical Co., Inc., New York.
 Whittaker, Clark & Daniels, Inc., New York.
 Wishnick-Tumpeur Chemical Co., Chicago, Ill.

Green Oxide of Chromium.

Butcher, L. H., Co., Inc., New York.
 Daigger, A., & Co., Chicago, Ill.
 Harshaw, Fuller & Goodwin Co., The, Cleveland, Ohio.
 Innis, Spelden & Co., Inc., New York.
 Reichard-Coulston, Inc., New York.
 Roessler & Hasslacher Chemical Co., New York.
 Scheel, William H., New York.
 Tidewater Chemical Co., Inc., New York.
 Waldo, B. M. & F., New York.
 Williams, C. K., & Co., Easton, Pa.
 Wishnick-Tumpeur Chemical Co., Chicago, Ill.

Guayule Rubber.

Continental Rubber Co., New York.
 Wilson, Charles T., Co., Inc., New York.

Gutta-Percha.

Astlett, H. A., & Co., New York.
 Baird Rubber & Trading Co., New York.
 Chipman, R. L., New York.
 Dunbar, J. Frank, Co., Inc., New York.
 Hankin, Geo., & Co., London, England.
 Hardy, R. S., Co., New York City.
 Jacoby, Ernest, Boston, Mass.
 Odell, Jas. E., Boston, Mass.
 Pell & Dumont, New York.
 Wood, Charles E., New York.

Hexamethylene Tetramine

Butcher, L. H., Co., Inc., New York.
 Daigger, A., & Co., Chicago, Ill.
 Roessler & Hasslacher Chemical Co., The, New York.
 Tidewater Chemical Co., Inc., New York.

Hydro-Carbon Products.

American Oil & Supply Co., Trenton, N. J.
 Butcher, L. H., Co., Inc., New York.
 Daigger, A., & Co., Chicago, Ill.
 Harshaw, Fuller & Goodwin Co., Cleveland, Ohio.
 Innis, Spelden & Co., Inc., New York City.
 Ohlmace Paint & Refining Co., Chicago, Ill.
 Robertson, H. H., Co., Pittsburgh, Pa.
 Scheel, William H., New York.
 States Metals Co., New York.
 Tidewater Chemical Co., Inc., New York.
 Vanderbilt, R. T., Co., New York.
 Whittaker, Clark & Daniels, Inc., New York.
 Wishnick-Tumpeur Chemical Co., Chicago, Ill.

Infusorial Earth—See Fossil Flour.

Iron Oxide—See Red Oxide

Lampblack.

Hinney & Smith Co., New York.
 Butcher, L. H., Co., Inc., New York.
 Cabot, Samuel, Boston, Mass.
 Daigger, A., & Co., Chicago, Ill.
 Harshaw, Fuller & Goodwin Co., The, Cleveland, Ohio.
 Innis, Spelden & Co., Inc., New York City.

Osborn, C. J., Co., New York.
 Pfaltz & Bauer, Inc., New York.
 Tidewater Chemical Co., Inc., New York.
 Tyson Bros., Inc., Woodbridge, N. J.
 Whittaker, Clark & Daniels, Inc., New York.
 Wishnick-Tumpeur Chemical Co., Chicago, Ill.

Lead—Blue.

Lead—Sublimed White.

Butcher, L. H., Co., Inc., New York.
 Daigger, A., & Co., Chicago, Ill.
 Harshaw, Fuller & Goodwin Co., The, Cleveland, Ohio.
 Pfaltz & Bauer, Inc., New York.
 Roessler & Hasslacher Chemical Co., New York.
 Tidewater Chemical Co., Inc., New York.
 Wishnick-Tumpeur Chemical Co., Chicago, Ill.

Lime Flour.

Butcher, L. H., Co., Inc., New York.
 Daigger, A., & Co., Chicago, Ill.
 Harshaw, Fuller & Goodwin Co., The, Cleveland, Ohio.
 Pfaltz & Bauer, Inc., New York.
 Scheel, William H., New York.
 Tidewater Chemical Co., Inc., New York.
 Whittaker, Clark & Daniels, Inc., N. Y.

Litharge.

Butcher, L. H., Co., Inc., New York.
 Daigger, A., & Co., Chicago, Ill.
 Harshaw, Fuller & Goodwin Co., The, Cleveland, Ohio.
 Innis, Spelden & Co., Inc., New York.
 Pfaltz & Bauer, Inc., New York.
 Roessler & Hasslacher Chemical Co., New York.
 Scheel, William H., New York.
 Tidewater Chemical Co., Inc., New York.
 Wishnick-Tumpeur Chemical Co., Chicago, Ill.

Lithopone.

American Oil & Supply Co., Trenton, N. J.
 Butcher, L. H., Co., Inc., New York.
 Daigger, A., & Co., Chicago, Ill.
 Harshaw, Fuller & Goodwin Co., Cleveland, Ohio.
 Innis, Spelden & Co., Inc., New York.
 Mineral Point Zinc Co., Chicago, Ill.
 New Jersey Zinc Co., New York.
 Osborn, C. J., Co., New York.
 Pfaltz & Bauer, Inc., New York.
 Reichard-Coulston, Inc., New York.
 Scheel, William H., New York.
 Tidewater Chemical Co., Inc., New York.
 Whittaker, Clark & Daniels, Inc., N. Y.
 Wishnick-Tumpeur Chemical Co., Chicago, Ill.

Magnesia Carbonate

American Oil & Supply Co., Trenton, N. J.
 Butcher, L. H., Co., Inc., New York.
 Daigger, A., & Co., Chicago, Ill.
 Harshaw, Fuller & Goodwin Co., Cleveland, Ohio.
 Innis, Spelden & Co., Inc., New York.
 National Aniline & Chemical Co., New York.
 Pfaltz & Bauer, Inc., New York.
 Reichard-Coulston, Inc., New York.
 Roessler & Hasslacher Chemical Co., New York.
 Scheel, William H., New York.
 States Metals Co., New York.
 Tidewater Chemical Co., Inc., New York.
 Whittaker, Clark & Daniels, Inc., N. Y.
 Wishnick-Tumpeur Chemical Co., Chicago, Ill.

Magnesia Oxide (Calcined)

Butcher, L. H., Co., Inc., New York.
 Cooper, Chas., & Co., New York.
 Daigger, A., & Co., Chicago, Ill.
 Gray, William S., & Co., New York.
 Innis, Spelden & Co., Inc., New York.
 Pfaltz & Bauer, Inc., New York.
 Reichard-Coulston, Inc., New York.
 Roessler & Hasslacher Chemical Co., New York.
 Scheel, William H., New York.
 States Metals Co., New York.
 Tidewater Chemical Co., Inc., New York.
 Whittaker, Clark & Daniels, Inc., New York.
 Wishnick-Tumpeur Chemical Co., Chicago, Ill.

For Complete Addresses See Advertisements—Index Page 73

We Manufacture a Variety of Shades of

RED OXIDE OF IRON

particularly adapted for
RUBBER MANUFACTURERS' USE

Extremely strong in coloring power and ground impalpably fine.
 Also various grades of Talc, Soapstone and Asbestine. Write
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C. K. WILLIAMS & CO.

Easton, Pa.





George W. Kavanaugh, Inc.
350 Broadway, New York
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Jacket Sheetings, Hollands
Plain—Tire Tapes—Loop Edge

Enameling Duck, Drills,
Sheetings, Osnaburgs
Constructed for the Rubber Trade

PELL & DUMONT, Inc.
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Akron, Office: Telephones:
 Ohio Building Main 1177-5899

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VELVET SULPHUR

Guaranteed 100 Pure and Free
 from grit for

RUBBER MANUFACTURERS

Also—Superfine Ventilated Commercial Flour Sulphur 95%, passing
 through a 200 mesh sieve.

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 Established 1840 80 Maiden Lane, New York, N. Y.

TYSON BROS. INC.

WOODBIDGE N. J.

MANUFACTURERS

The best grades of Rubber Substitutes and
 Chemicals for all branches of the
 Rubber Trade

Western Representative STOCK CARRIED IN
 J. A. KENDALL AKRON
 524 Second National Bldg., Akron, Ohio

WOBURN OIL

A New Rubber Softener

THE WOBURN DEGREASING CO.
 HARRISON, N. J.

WOVEN STEEL HOSE & RUBBER COMPANY

Manufacturers of **Long Length Moulded Hose**

On Reels of Approximately 500 Feet For Air and Water

ARMORED OR PLAIN LOCOMOTIVE SQUIRT HOSE COMPLETE WITH FITTINGS

Mechanical Rubber Goods

Automobile Brake Lining

TRENTON, N. J., U. S. A.

RUBBER BUYERS' DIRECTORY—Continued

Marking and Stencil Ink.

Binney & Smith Co., New York, N. Y.

Mica.

Butcher, L. H., Co., Inc., New York.
Daigger, A., & Co., Chicago, Ill.
Scheel, William H., New York.
Tidewater Chemical Co., Inc., New York.
Whittaker, Clark & Daniels, Inc., N. Y.
Wishnick-Tumpeur Chemical Co., Chicago, Ill.

Mineral Rubber.

American Oil & Supply Co., Trenton, N. J.
Barber Asphalt Paving Co., Philadelphia, Pa.
Butcher, L. H., Co., Inc., New York.
Daigger, A., & Co., Chicago, Ill.
Harshaw, Fuller & Goodwin Co., The, Cleveland, Ohio.
Innis, Speiden & Co., Inc., New York.
Inter-Ocean Oil Co., New York.
Olinac Paint & Refining Co., Chicago, Ill.
Pioneer Asphalt Co., Lawrenceville, Ill.
Rare Metal Products Co., Belleville, N. J.
Robertson, H. H., Co., Pittsburgh, Pa.
Scheel, William H., New York.
States Metals Co., New York.
Synthetic Products Co., Cleveland, Ohio.
Tidewater Chemical Co., Inc., New York.
Vanderbilt, R. T., Co., New York.
Whittaker, Clark & Daniels, Inc., New York.
Wishnick-Tumpeur Chemical Co., Chicago, Ill.

Naphtha.

Daigger, A., & Co., Chicago, Ill.
Wishnick-Tumpeur Chemical Co., Chicago, Ill.

Oils—Tar, Pine, Creosote, Rosin, Turpentine.

American Oil & Supply Co., Trenton, N. J.
Daigger, A., & Co., Chicago, Ill.
Harshaw, Fuller & Goodwin Co., The, Cleveland, Ohio.
West Co., Inc., H. T., Boston.
Wishnick-Tumpeur Chemical Co., Chicago, Ill.

Oils—Vegetable.

Butcher, L. H., Co., Inc., New York.
Daigger, A., & Co., Chicago, Ill.
Harshaw, Fuller & Goodwin Co., The, Cleveland, Ohio.
Tidewater Chemical Co., Inc., New York.
Wishnick-Tumpeur Chemical Co., Chicago, Ill.

Petrolatum.

Tidewater Chemical Co., Inc., New York.
Vanderbilt, R. T., Co., New York.

Pigments.

Aluminum Flake Co., Akron, Ohio.
American Oil & Supply Co., Trenton, N. J.
Butcher, L. H., Co., Inc., New York.
Cooper, Chas., & Co., New York.
Daigger, A., & Co., Chicago, Ill.
Harshaw, Fuller & Goodwin Co., Cleveland, Ohio.
Industrial Chemical Co., New York.

Pigments—Continued.

Innis, Speiden & Co., Inc., New York City.
Kilpstein, A., & Co., New York City.
Mineral Point Zinc Co., Chicago, Ill.
New Jersey Zinc Co., The, New York.
Pfaltz & Bauer, Inc., New York.
Reichard-Coulston, Inc., New York.
Roessler & Hasslacher Chemical Co., New York.
Scheel, William H., New York.
Tidewater Chemical Co., Inc., New York.
Waldo, E. M. & F., New York.
Westmoreland Chemical & Color Co., Philadelphia, Pa.
Whittaker, Clark & Daniels, Inc., New York.
Williams, C. K., & Co., Easton, Pa.
Wishnick-Tumpeur Chemical Co., Chicago, Ill.

Pine Tar.

Daigger, A., & Co., Chicago, Ill.
Harshaw, Fuller & Goodwin Co., The, Cleveland, Ohio.
Tidewater Chemical Co., Inc., New York.
West, H. T., Co., Boston, Mass.
Wishnick-Tumpeur Chemical Co., Chicago, Ill.

Pitch.

Daigger, A., & Co., Chicago, Ill.
Rubber Service Laboratories, The, Akron, Ohio.
Scheel, William H., New York.
Tidewater Chemical Co., Inc., New York.
West, H. T., Co., Boston, Mass.
Wishnick-Tumpeur Chemical Co., Chicago, Ill.

Precipitated Chalk.

Daigger, A., & Co., Chicago, Ill.
Industrial Chemical Co., New York City.
Innis, Speiden & Co., Inc., New York City.
Pfaltz & Bauer, Inc., New York.
Roessler & Hasslacher Chemical Co., New York.
Tidewater Chemical Co., Inc., New York.
Whittaker, Clark & Daniels, Inc., New York.
Wishnick-Tumpeur Chemical Co., Chicago, Ill.

Pumice Stone.

Daigger, A., & Co., Chicago, Ill.
Harshaw, Fuller & Goodwin Co., Cleveland, Ohio.
Pfaltz & Bauer, Inc., New York.
Whittaker, Clark & Daniels, Inc., New York.
Wishnick-Tumpeur Chemical Co., Chicago, Ill.

"Quaker" Whiting.

Vanderbilt, R. T., Co., New York.
Whittaker, Clark & Daniels, Inc., New York.

Reclaimed Rubber.

Appleton Rubber Co., Boston, Mass.
Baird Rubber & Trading Co., New York (Agent).
Clapp, E. H., Rubber Co., Boston, Mass.
Dunbar, J. Frank, Co., Inc., New York.
McGrory, Philip, Trenton, N. J. (Agent).
Monastiquet Rubber Works Co., South Braintree, Mass.
Nearpara Rubber Co., Trenton, N. J.
New Jersey Rub. Co., Lambertville, N. J.
Odell, Jas. E., Boston, Mass. (Agent).
Pell & Dumont, New York (Agent).
Pequanoe Rubber Co., Butler, N. J.

Reclaimed Rubber—Continued.

Philadelphia Rubber Works, Philadelphia, Pa.
Rubber Regenerating Co., Naugatuck, Conn.
Somerset Rubber Reclaiming Works, New Brunswick, N. J.
U. S. Rubber Reclaiming Co., Inc., N. Y.
Vulcan Recovery Co., Trenton, N. J.

Red Oxide.

American Oil & Supply Co., Trenton, N. J.
Binney & Smith Co., New York.
Butcher, L. H., Co., Inc., New York.
Cooper, Chas., & Co., New York.
Daigger, A., & Co., Chicago, Ill.
Harshaw, Fuller & Goodwin Co., Cleveland, Ohio.
Innis, Speiden & Co., Inc., New York City.

McNulty, Joseph A., New York.
Pfaltz & Bauer, Inc., New York.
Osborn, C. J., Co., New York.
Reichard-Coulston, Inc., New York.
Roessler & Hasslacher Chemical Co., New York.
Scheel, William H., New York.
Smith, J. Lee, & Co., New York.
Tidewater Chemical Co., Inc., New York.
Tyson Bros., Inc., Woodbridge, N. J.
Waldo, E. M. & F., New York.

Westmoreland Chemical & Color Co., Philadelphia, Pa.
Whittaker, Clark & Daniels, Inc., New York.
Williams, C. K., & Co., Easton, Pa.
Wishnick-Tumpeur Chemical Co., Chicago, Ill.

Resin.

Daigger, A., & Co., Chicago, Ill.
Scheel, William H., New York.
Tidewater Chemical Co., Inc., New York.
Wishnick-Tumpeur Chemical Co., Chicago, Ill.

Rosin.

Daigger, A., & Co., Chicago, Ill.
Harshaw, Fuller & Goodwin Co., The, Cleveland, Ohio.
Scheel, William H., New York.
Tidewater Chemical Co., Inc., New York.
West, H. T., Co., Boston, Mass.
Wishnick-Tumpeur Chemical Co., Chicago, Ill.

Rotten Stone.

Daigger, A., & Co., Chicago, Ill.
Harshaw, Fuller & Goodwin Co., The, Cleveland, Ohio.
Pfaltz & Bauer, Inc., New York.
Scheel, William H., New York.
Whittaker, Clark & Daniels, Inc., New York.

Rubber Flux.

Synthetic Products Co., Cleveland, Ohio.
Tidewater Chemical Co., Inc., New York.

Rubber Makers' White.

Butcher, L. H., Co., Inc., New York.
Daigger, A., & Co., Chicago, Ill.
Reichard-Coulston, Inc., New York.
Tidewater Chemical Co., Inc., New York.
Whittaker, Clark & Daniels, Inc., New York.
Wishnick-Tumpeur Chemical Co., Chicago, Ill.

Rubber Softener.

Rubber Service Laboratories, The, Akron, Ohio.
Woburn Degreasing Co., The, Harrison, N. J.

Rubber Substitutes.

American Oil & Supply Co., Trenton, N. J.
Ashley, T. C., & Co., Boston, Mass.
Butcher, L. H., Co., Inc., New York.
Carter Bell Mfg. Co., New York.
Daigger, A., & Co., Chicago, Ill.
Jacoby, Ernest, Boston, Mass.
Scheel, Wm. H., New York.
Stamford Rubber Supply Co., Stamford, Conn.
T. H. & B. Chemical Co., So. Boston, Mass.
Type & King, London, England.
Tyson Bros., Inc., Woodbridge, N. J.
Wishnick-Tumpeur Chemical Co., Chicago, Ill.

Scrap Rubber.

Birkenstein & Sons, S., Chicago, Ill.
Chalpin, Joseph, New York.
Cummings & Sons, Wm. H., New York.
McGrory, Philip, Trenton, N. J.
Muehlstein & Co., H., New York.
Norton & Co., M., Medford, Mass.
Schnurmann, J., London, England.
Weber, Hermann, New York.

Silica.

Butcher, L. H., Co., Inc., New York.
Daigger, A., & Co., Chicago, Ill.
Innis, Speiden & Co., Inc., New York City.
Pfaltz & Bauer, Inc., New York.
Roessler & Hasslacher Chemical Co., New York.
Tidewater Chemical Co., Inc., New York.
Whittaker, Clark & Daniels, Inc., New York.
Wishnick-Tumpeur Chemical Co., Chicago, Ill.

Soapstone.

Binney & Smith Co., New York.
Butcher, L. H., Co., Inc., New York.
Daigger, A., & Co., Chicago, Ill.
Harshaw, Fuller & Goodwin Co., The, Cleveland, Ohio.
Pfaltz & Bauer, Inc., New York.
Scheel, William H., New York.
Tidewater Chemical Co., Inc., New York.
Whittaker, Clark & Daniels, Inc., New York.
Williams, C. K., & Co., Easton, Pa.
Wishnick-Tumpeur Chemical Co., Chicago, Ill.

Sulphur.

Battelle & Renwick, New York.
Butcher, L. H., Co., Inc., New York.
Cooper, Chas., & Co., New York.
Daigger, A., & Co., Chicago, Ill.
Harshaw, Fuller & Goodwin Co., Cleveland, Ohio.
Innis, Speiden & Co., Inc., New York City.
Pfaltz & Bauer, Inc., New York.
Roessler & Hasslacher Chemical Co., New York.
Southern Acid & Sulphur Co., St. Louis, Missouri.
Tidewater Chemical Co., Inc., New York.

For Complete Addresses See Advertisements—Index Page 73

For Coloring the Finest Quality of Rubber You Safely Can Use

OXIMONY

Regd. U. S. Pat. Off.

The Super Red Oxide for Rubber

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Factory, Harman, Md.

Middle Western Office, 30 N. La Salle St., Chicago, Ill.



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H. T. West Company

CHICAGO, ILLINOIS

Wishnick-Tumpeier Chemical Co.

TRENTON, N. J.

H. N. Richards Co.

CLEVELAND, OHIO

Wishnick-Tumpeier Chemical Co.

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Lawrenceville, Ill.

New York Representative,

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Antimony Sulphuret Golden and Crimson

are made with any percentage of free Sulphur to suit your individual requirements.

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1816

Modern Methods
1921

Carbon Tetrachloride Rubber Makers' Lime

Heavy Calcined Magnesia

Caustic Soda

"Carrara" Filler

And Other Rubberworkers' Specialties

INNIS, SPEIDEN & CO.

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ALDEHYDE AMMONIA
FORMALDEHYDE ANILINE
HEXAMETHYLENETETRAMINE
METHYLENE PARA TOLUIDINE
DIPHENYL GUANIDINE
ETHYLIDENE ANILINE
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TRENTON
BOSTON
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STATES METALS CO., Inc.

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NEW YORK

SULPHURET OF ANTIMONY

"STATES" Brand RED, 15/17% Free Colloidal Sulphur
No. 6063 Calcium Free GOLDEN, 35% Free Colloidal Sulphur
"STATES" Brand CRIMSON, Sulphur Free and 15/17% Free Sulphur.

The best compounding ingredient for stocks where ability to withstand natural aging is of paramount importance. Permit us to submit proofs.

District Representatives

J. A. KENDALL
Akron

MARTIN, HOYT & MILNE
San Francisco

HARRY T. KRAFT
New York

JAMES E. ODELL
Boston

RUBBER BUYERS' DIRECTORY — Continued

Sulphur—Continued.

White, T. & S. Co., Co., New York.
Whittaker, Clark & Daniels, Inc., New York.
Wishnick-Tumpeur Chemical Co., Chicago, Ill.

Sulphur Chloride.

Ashley, T. C. & Co., Boston, Mass.
Butcher, L. H., Co., Inc., New York.
Carter Bell Mfg. Co., New York.
Cooper, Chas., & Co., New York.
Daigler, A., & Co., Chicago, Ill.
Harshaw, Fuller & Goodwin Co., Cleveland, Ohio.

Innis, Speiden & Co., Inc., New York City.

Pfaltz & Bauer, Inc., New York.
Scheel, William H., New York.
Stamford Rubber Supply Co., Stamford, Conn.

Tidewater Chemical Co., Inc., New York.
Tyson Bros., Inc., Woodbridge, N. J.
Wishnick-Tumpeur Chemical Co., Chicago, Ill.

Talc.

Glinney & Smith Co., New York.
Butcher, L. H., Co., Inc., New York.
Daigler, A., & Co., Chicago, Ill.
Harshaw, Fuller & Goodwin Co., Cleveland, Ohio.
Innis, Speiden & Co., Inc., New York City.

Pfaltz & Bauer, Inc., New York.
Reichard-Coulston, Inc., New York.
Roessler & Hasslacher Chemical Co., New York.
Scheel, William H., New York.
Tidewater Chemical Co., Inc., New York.
Vanderbilt, R. T., Co., Inc., New York.
Waldo, E. M. & F., New York.
Whittaker, Clark & Daniels, Inc., New York.
Williams, C. K., & Co., Boston, Pa.
Wishnick-Tumpeur Chemical Co., Chicago, Ill.

Thiocarbamid.

Butcher, L. H., Co., Inc., New York.
Daigler, A., & Co., Chicago, Ill.
Katsenbach & Bullock Trading Co., Inc., New York.
Rubber Service Laboratories Co., Inc., The, Akron, Ohio.

Tripoli Flour.

American Tripoli Co., Seneca, Mo.
Daigler, A., & Co., Chicago, Ill.
Harshaw, Fuller & Goodwin Co., Cleveland, Ohio.
Innis, Speiden & Co., Inc., New York City.

Pfaltz & Bauer, Inc., New York.
Scheel, William H., New York.
Whittaker, Clark & Daniels, Inc., New York.
Wishnick-Tumpeur Chemical Co., Chicago, Ill.

Wax

Daigler, A., & Co., Chicago, Ill.
Dunbar, J. Frank, Co., Inc., New York.
Harshaw, Fuller & Goodwin Co., The, Cleveland, Ohio.

Innis, Speiden & Co., Inc., New York City.
Scheel, William H., New York.
Tidewater Chemical Co., Inc., New York.
Vanderbilt, R. T., Co., New York.
West, H. T., Co., Boston, Mass.
Wishnick-Tumpeur Chemical Co., Chicago, Ill.

White and Blue Lead, Sublimed.

Butcher, L. H., Co., Inc., New York.
Daigler, A., & Co., New York.
Harshaw, Fuller & Goodwin Co., The, Cleveland, Ohio.
Pfaltz & Bauer, Inc., New York.
Roessler & Hasslacher Chemical Co., New York.
Tidewater Chemical Co., Inc., New York.
Wishnick-Tumpeur Chemical Co., Chicago, Ill.

Whiting.

American Oil & Supply Co., Trenton, N. J.
Butcher, L. H., Co., Inc., New York.
Columbia Products Co., Cleveland, Ohio.
Daigler, A., & Co., Chicago, Ill.
Gray, William S., & Co., New York.
Harshaw, Fuller & Goodwin Co., Cleveland, Ohio.

Whiting—Continued.

Industrial Chemical Co., New York.
Pfaltz & Bauer, Inc., New York.
Roessler & Hasslacher Chemical Co., New York.

Reichard-Coulston, Inc., New York.
Scheel, William H., New York.
Taintor, H. F., Mfg. Co., New York.
Tidewater Chemical Co., Inc., New York.
Tyson Bros., Inc., Woodbridge, N. J.
Vanderbilt, R. T., & Co., Inc., New York.

Whittaker, Clark & Daniels, Inc., New York.
Wishnick-Tumpeur Chemical Co., Chicago, Ill.

Wood Flour.

Daigler, A., & Co., Chicago, Ill.
Industrial Chemical Co., New York.
Tidewater Chemical Co., Inc., New York.
Whittaker, Clark & Daniels, Inc., New York.
Wishnick-Tumpeur Chemical Co., Chicago, Ill.

Zinc, Oxide of.

American Oil & Supply Co., Trenton, N. J.
American Zinc Sales Co., New York.
Butcher, L. H., Co., Inc., New York.
Cooper, Charles, & Co., New York.
Daigler, A., & Co., Chicago, Ill.
Harshaw, Fuller & Goodwin Co., Cleveland, Ohio.
Innis, Speiden & Co., Inc., New York City.
Mineral Point Zinc Co., Chicago, Ill.
National Aniline & Chemical Co., New York.
New Jersey Zinc Co., New York.
Osborn, C. J., Co., New York.
Pfaltz & Bauer, Inc., New York.
Reichard-Coulston, Inc., New York.
Roessler & Hasslacher Chemical Co., New York.
Scheel, William H., New York.
Tidewater Chemical Co., Inc., New York.
Whittaker, Clark & Daniels, Inc., New York.

Zinc, Oxide of—Continued.

Wishnick-Tumpeur Chemical Co., Chicago, Ill.

Zinc Substitute.

Butcher, L. H., Co., Inc., New York.
Pfaltz & Bauer, Inc., New York.
Scheel, William H., New York.
Tidewater Chemical Co., Inc., New York.

Zinc Sulphide.

Butcher, L. H., Co., Inc., New York.
Harshaw, Fuller & Goodwin Co., The, Cleveland, Ohio.
Pfaltz & Bauer, Inc., New York.
Reichard-Coulston, Inc., New York.

MISCELLANEOUS

Brass Fittings.

Boston Woven Hose & Rubber Co., Cambridge, Mass.
Dixon Valve & Coupling Co., Philadelphia, Pa.

Schrader's A., Son, Inc., New York.

Consulting Rubber Chemists.

Kent Rubber Laboratory, Kent, Ohio.
Maywald, Dr. F. J., Newark, N. J.
Weber, Dr. Lothar E., Boston, Mass.

Consulting Rubber Engineers.

Dunbar, Wilmer, Greensburg, Pa.
Kent Rubber Laboratory, Kent, Ohio.

Consulting Rubber Technologist.

Norris, Webster, Brooklyn, N. Y.

Factory Lighting.

Cooper-Hewitt Electric Co., Hoboken, N. J.

Rubber Plant Engineers

Akron Engineering Co., The, Akron, O.
Consulting Co., Cincinnati, Ohio.
Osborn Engineering Co., The, Cleveland, Ohio.

Rubber Engineering Co., Akron, Ohio.

Submarine Outfits.

Schrader's A., Son, Inc., New York.

For Complete Addresses See Advertisements—Index Page 73

QUALITY

Don't forget these outstanding qualities of Azo ZZZ

The lead free zinc oxide

PURITY, UNIFORMITY, UTILITY

And we can supply your needs from two plants and warehouse stocks all over the U. S. A.

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Azo ZZZ—Lead Free
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View taken from
an airplane
in 1921

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E. DE HAËN

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Golden and Crimson

BLACK HYPO

ARSENIC SULPHIDE

Red and Yellow

A.-G.

ZINC SULPHIDE—White—96/98%

LITHOPONE—R.S. 30%

XANTHOPONE

IRON OXIDES

SOLE AGENTS FOR THE U. S. A.

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Manufacturers and packers of nails for the rubber heel trade. Count absolutely guaranteed. Any style nail, made and packed to your requirements. We are supplying the largest rubber heel plants in the world, and will be pleased to quote you for the coming season.

RUBBER HEEL BURRS

Independent Nail & Packing Co.

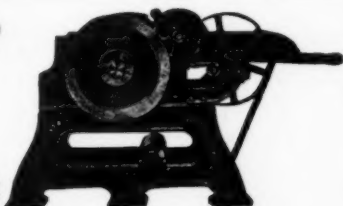
BRIDGEWATER, MASS., U. S. A.

Sole packers of rubber heel nails on the "Stone Automatic Bag Filling Machine"

Rubber



Scrap Cutters



Will Properly Cut Up Your Rubber Scrap
Make the Work Easier for the Cracker.

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Rubber Makers Litharge

Rubber Makers Hydro-Carbon

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OXIDE OF IRON

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This means maximum value for your money, dependable service, reasonable prices, assurance of highest quality output at production cost to meet competitive tire prices.

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